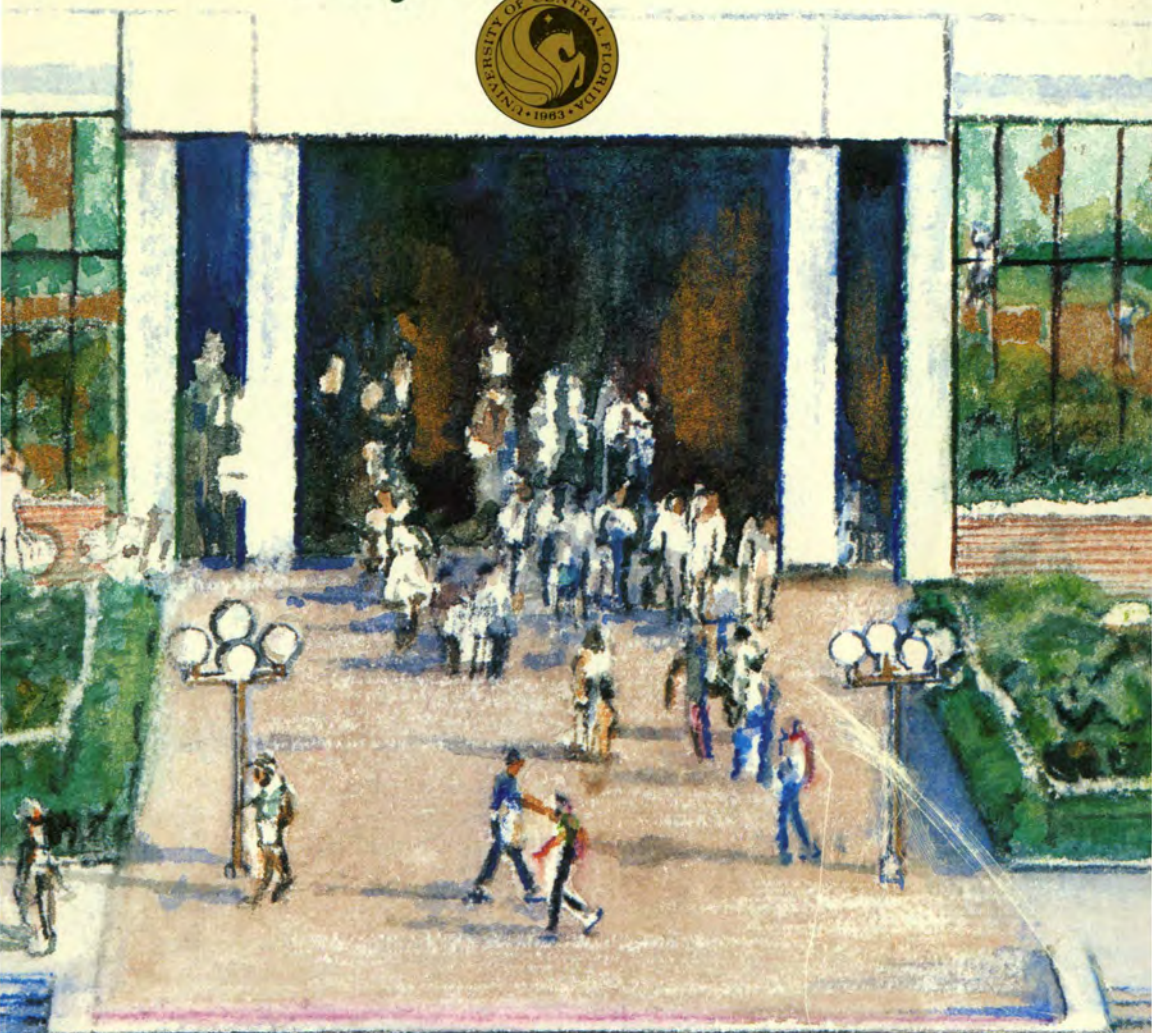


University of Central Florida



1991-1992

GRADUATE CATALOG

DEGREES OFFERED

COLLEGE OF ARTS AND SCIENCES

Master of Arts

Communication
English
Creative Writing
Literature
History
Political Science
Sociology, Applied

Master of Science

Biology
Chemistry, Industrial
Computer Science
Mathematical Science
Physics
Psychology
Clinical
Industrial/Organizational
Statistical Computing

Doctor of Philosophy

Computer Science
Physics
Psychology
Human Factors

COLLEGE OF BUSINESS ADMINISTRATION

Master of Arts in Applied Economics (M.A.A.E.)

Master of Science in Accounting (M.S.A.)

Master of Science in Taxation (M.S.T.)

Master of Business Administration (M.B.A.)

Doctor of Philosophy Business Administration

COLLEGE OF EDUCATION

Master of Arts and/or Master of Education

Art Education
Business Education
Counselor Education
Educational Leadership
Educational Media
Elementary Education
English Language Arts
Exceptional Child

Educational Specialist

Curriculum and Instruction
Educational Leadership
School Psychology

Instructional Systems
Mathematics Education
Music Education
Physical Education
Reading Education
Science Education
Social Science Education
Vocational Education

Doctor of Education

Curriculum and Instruction
Educational Leadership

COLLEGE OF ENGINEERING

Master of Science (M.S.)

Computer Integrated
Manufacturing
Computer Systems
Construction
Electrical Systems
& Sciences
Engineering Management
Engineering Systems Analysis
Environmental Sciences
Materials Science & Engineering
Mechanical Systems
Operations Research
Product Assurance Engineering
Simulation Systems
Structures & Foundations
Thermo-Fluids
Transportation Systems

Master of Science in Engineering (M.S.E.)

Civil Engineering
Computer Engineering
Electrical Engineering
Environmental Engineering
Industrial Engineering
Manufacturing Engineering
Mechanical Engineering

Doctor of Philosophy

Civil Engineering
Computer Engineering
Electrical Engineering
Environmental Engineering
Industrial Engineering
Mechanical Engineering

Master of Civil Engineering (M.C.E.)

COLLEGE OF HEALTH AND PUBLIC AFFAIRS

Master of Arts

Communicative Disorders

Master of Science

Health Sciences
Molecular Biology & Microbiology

Master of Public Administration (M.P.A.)

GRADUATE CATALOG

UNIVERSITY

OF

CENTRAL FLORIDA

1991-92



PEGASUS was the winged horse of the muses in Greek Mythology. He carried their hopes, their aspirations, and their poetry into the skies. PEGASUS is as futuristic as tomorrow's space exploration in our solar system and into the universe beyond. The seal also bridges the gap between the humanities and space technology.

*Accent on the Individual
and on Excellence*

Orlando, Florida
Volume X

DEGREES OFFERED

COLLEGE OF ARTS AND SCIENCES

Master of Arts

Communication
English
Creative Writing
Literature
History
Political Science
Sociology, Applied

Master of Science

Biology
Chemistry, Industrial
Computer Science
Mathematical Science
Physics
Psychology
Clinical
Industrial/Organizational
Statistical Computing

Doctor of Philosophy

Computer Science
Physics
Psychology
Human Factors

COLLEGE OF BUSINESS ADMINISTRATION

Master of Arts in Applied Economics

(M.A.A.E.)

Master of Business Administration

(M.B.A.)

Master of Science in Accounting

(M.S.A.)

Doctor of Philosophy

Business Administration

Master of Science in Taxation

(M.S.T.)

COLLEGE OF EDUCATION

Master of Arts and/or Master of Education

Art Education
Business Education
Counselor Education
Educational Leadership
Educational Media
Elementary Education
English Language Arts
Exceptional Child

Instructional Systems
Mathematics Education
Music Education
Physical Education
Reading Education
Science Education
Social Science Education
Vocational Education

Educational Specialist

Curriculum and Instruction
Educational Leadership
School Psychology

Doctor of Education

Curriculum and Instruction
Educational Leadership

COLLEGE OF ENGINEERING

Master of Science (M.S.)

Computer Integrated
Manufacturing
Computer Systems
Construction
Electrical Systems
& Sciences
Engineering Management
Engineering Systems Analysis
Environmental Sciences
Materials Science & Engineering
Mechanical Systems
Operations Research
Product Assurance Engineering
Simulation Systems
Structures & Foundations
Thermo-Fluids
Transportation Systems

Master of Science in Engineering (M.S.E.)

Civil Engineering
Computer Engineering
Electrical Engineering
Environmental Engineering
Industrial Engineering
Manufacturing Engineering
Mechanical Engineering

Doctor of Philosophy

Civil Engineering
Computer Engineering
Electrical Engineering
Environmental Engineering
Industrial Engineering
Mechanical Engineering

Master of Civil Engineering (M.C.E.)

COLLEGE OF HEALTH AND PUBLIC AFFAIRS

Master of Arts

Communicative Disorders

Master of Science

Health Sciences
Molecular Biology & Microbiology

Master of Public Administration (M.P.A.)

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Recent program changes may not be reflected in this catalog. Students should check with the appropriate graduate program coordinator for current information. Rules, policies, fees, and courses described in the catalog are subject to change without notice.

CORRESPONDENCE DIRECTORY

Address Correspondence

University of Central Florida
Orlando, Florida 32816

Admission to Graduate Studies

Graduate Admissions Office
Phone: (407) 823-2766

Program Information

Contact College Dean's Office

Housing

Manager, Student Housing
Phone: (407) 823-4663

Financial Aid/Out-of-State Tuition Assistance

Contact College Dean's Office

Cover Design: Jagdish J. Chavda

To acquaint the student with the programs of study and the cost of attending the university, this public document was promulgated at an annual cost of \$1.09 per copy.

ADMINISTRATION AND STAFF

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Center for Research in Electro-Optics & Lasers	M.J. Soileau

CENTRAL FLORIDA RESEARCH PARK

Director	Richard W. Tesch
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COLLEGES, GRADUATE PROGRAMS, AND DEPARTMENT CHAIRS

College of Arts and Sciences

Dean	Edward P. Sheridan
Assistant Dean	Kathryn L. Seidel
Assistant Dean for Budget	Bruce A. Whisler
Biological Sciences	David H. Vickers
Chemistry	D. Howard Miles
Communication	James W. Welke
Computer Science	Terry J. Frederick
English	John F. Schell
History	Jerrell H. Shofner
Mathematics	Lokenath Debnath
Physics	Subir K. Bose
Political Science	Elliot M. Vities
Psychology	Richard D. Tucker
Sociology and Anthropology	David A. Fabianic
Statistics	Mark E. Johnson

College of Business Administration

Dean	Richard C. Huseman
Associate Dean	John D. Hatfield
Associate Dean	Harey S. Lewis
Accountancy	Thomas G. Evans
Economics	W. Warren McHone
Finance	Ronnie J. Clayton
Management	Halsey R. Jones
Marketing	Duane L. Davis

College of Education

Dean	William H. Johnson
Associate Dean	Maryann Lynn
Assistant Dean	John H. Armstrong
Instructional Programs	Daniel Kirby
Educational Services	Robert Rothberg
Educational Foundations	Alexander T. Wood
Exceptional and Physical Education	Michael W. Churton

College of Engineering

Dean	Gary E. Whitehouse
Associate Dean	Stephen L. Rice
Associate Dean	Richard N. Miller
Director of Graduate Affairs	Fred Gunnerson
Director of Undergraduate Affairs	James K. Beck
Civil and Environmental Engineering	A. Essam Radwan
Computer Engineering	Christian S. Bauer
Electrical Engineering	Nicolaos Tzannes
Industrial Engineering and Management Systems	William W. Swart
Mechanical and Aerospace Engineering	David Nicholson

College of Health and Public Affairs

Dean	Belinda R. McCarthy
Associate Dean	Wendell C. Lawther
Interim Associate Dean	Martha Jo Edwards
Communicative Disorders	Walter D. Tropf
Health Sciences	Thomas Mendenhall
Molecular Biology and Microbiology	R.N. Gennaro
Public Administration	Peter W. Colby

THE UNIVERSITY

UNIVERSITY OF CENTRAL FLORIDA

The University of Central Florida opened in the fall of 1968. Its original name, Florida Technological University, was changed by the Florida Legislature on December 6, 1978. This name change reflects the changing role of the University in the Central Florida area. Initially, the University was developed in response to the Cape Kennedy space complex, but with its enthusiastic acceptance by the Central Florida community and its rapid growth, the University began to acquire a broader educational mission.

The University's presently assigned role within the nine-campus State University System of Florida is that of a general purpose institution offering degree programs at all levels of instruction. In addition, the University has the responsibility of assisting in the economic development of the Central Florida region, especially in the areas of high technology, electronics, and tourism.

STATEMENT OF PURPOSE

The University of Central Florida serves the people of Florida by providing graduate education in most general areas of study and in specifically selected technological and professional disciplines.

Master's degree programs are offered in over forty areas of the University. Doctoral programs are available in computer science, engineering, education, human factors psychology, and business administration.

INSTITUTIONAL PHILOSOPHY

The University of Central Florida's philosophy is based upon two tenets: ACCENT ON THE INDIVIDUAL and ACCENT ON EXCELLENCE. The University believes in the individual worth of each person and especially encourages the responsible individual who strives for excellence in every activity.

Research is considered an important part of advanced study, and UCF provides students with opportunities for research projects and independent study. Many projects involve community service and opportunities for student experience while receiving individual guidance from faculty.

In order to better serve the community, the University of Central Florida makes higher education easily available to the citizens of East Central Florida by operating off-campus centers.

ACCREDITATION

The graduate programs of the University are accredited by the Southern Association of Colleges and Schools, the official regional accrediting agency for educational institutions in the South.

In addition to the regional accreditation agencies, there are a number of scientific, professional, and academic bodies conferring accreditation in specific disciplines. The College of Business Administration is accredited by the American Assembly of Collegiate Schools of Business (AACSB). All teacher education programs are fully accredited by the Florida State Department of Education. UCF is listed with an 'A' rating in the Report of Credit Given by Educational Institutions.

EAST CENTRAL FLORIDA AREA

UCF is located in the east central Florida region with a population estimated at 1.7 million. The area is endowed with a rich heritage of cultural, educational, industrial, and recreational activities. Cultural activities include a symphony orchestra, civic theater, dinner theaters, art galleries, and museums. The beauty of the Orlando area is evidenced by its numerous parks and flower gardens. In addition to UCF, educational needs of the area are served through quality public school systems, public community colleges, and several privately supported colleges and schools. Recreational opportunities abound in the Orlando area.

THE CAMPUS

The campus of UCF, located 13 miles east of downtown Orlando, consists of 1,227 acres of land in a scenic setting of pine, palm, cypress, cedar, and oak trees. Lake Claire, covering 40 acres, and Lake Lee, covering 14 acres, contribute to the natural beauty of the campus. Since campus construction began in 1966, more than 45 buildings have been built including the library, classroom buildings, laboratories, residence halls, and student facilities. The Creative School for Children was built with funds contributed by the Edyth Bush Charitable Foundation of Winter Park and the UCF Student Government. Recreational facilities include lighted tennis and handball courts, a flag football/soccer field, a swimming pool, a golf driving range with putting greens, volleyball courts, and a baseball field. The campus currently serves over 21,000 students.

Living quarters in UCF's residence halls consist of double bedroom suites with a common living room and bath, functional furnishings, and maid service. Common laundry facilities and lounges for study and social activities are available. For more detailed information on campus housing, please contact the Director of Housing.



UNIVERSITY LIBRARY

The University Library, now expanded to a facility of 200,200 square feet, provides materials and services to support the instructional and research needs of the University. The Library's collection now numbers approximately 600,000 volumes, 1,050,000 microforms, 5,000 current serial titles, 250,000 government documents, and 10,000 volumes in special collections. On-line access to OCLC and commercial databases is available. Special library services are provided for physically handicapped students. The Library is a depository for U.S. and Florida state documents.

The Audiovisual Services Section provides a wide variety of A/V equipment. Films and facilities to preview them are also located there. Other audiovisual materials, recordings, tapes, filmstrips, and mixed media kits are housed in the library proper.

RESEARCH FACILITIES

Research facilities include the Northeast Data Center Amdahl 470 computer, with remote batch access and interactive processing through department and computer center equipment; a CDC 205 Supercomputer; IBM 3090s, 4341s and 4381s; a VAX-11/780 with peripheral devices; several microcomputers; and Tektronix graphics equipment. In addition to the normal complement of laboratory instrumentation, scale-up and industrial control equipment is available for chemistry. Well-equipped laboratories are available for research in all areas of the biological sciences, as are a greenhouse, an extensive herbarium, a vertebrate collection, complete animal facilities, and outstanding inland and coastal natural resources for fieldwork.

The engineering departments maintain modern, well-equipped laboratories and shop facilities. Close liaison is maintained with the Florida Solar Energy Center and the Central Florida Research Park. In addition to the fully equipped instrumental biofeedback research laboratory and psychological testing laboratory, there are physiological research laboratories and communicative disorders facilities.

SPONSORED JOURNALS AND PUBLICATIONS

The University's research efforts include sponsorship of a number of journals in a variety of disciplines.

The Business Barometer of Central Florida. Editor, Dr. Edward Day

The Business Barometer of Central Florida is a quarterly publication which reports on various economics data pertinent to the local business community. A generous grant from Sun Bank, N.A., aids the College of Business Administration in publishing *The Business Barometer*.

The Canadian Review. Editor, Dr. Katherine Z. Keller

The Canadian Review is the publication of the Canadian Studies Programme of the University of Central Florida. It publishes articles, notes, teaching materials, and book reviews of interest to students and teachers of all areas of Canadian Studies.

Co-Ed Transactions. Co-editors, Dr. R. C. Harden and Dr. F. O. Simons, Jr.

A journal of the Computers in Education Division of ASEE. It publishes papers, application notes, and news items which are relevant to analog, hybrid and digital computation in education.

Florida Association of Science Teachers Journal. Co-editors, Dr. R. C. Bird and Dr. J. H. Armstrong

The *FAST Journal* is the official publication of the Florida Association of Science Teachers, Inc., the Florida chapter of the National Science Teachers Association. This journal is a peer-reviewed publication, published three times a year, and is devoted to the advancement of science education.

Florida Journal of Supervision and Curriculum Development, (FASCD) Newsletter. Editor, Dr. M. L. Kysilka

The *Florida Journal of Supervision and Curriculum Development* is the official publication of the Florida Association for Supervision and Curriculum Development. The journal is a refereed journal and is intended for all persons interested in curriculum, instruction, supervision and leadership in education. Issues are theme based and contain articles by leading educators, reports of programs and practices, interpretations and reports of research and book reviews. The *Florida Journal* is published three times a year.

Florida Media Quarterly. Editor, Dr. D. J. Toler

Florida Media Quarterly, the official publication of the Florida Association for Media in Education, disseminates current information about all aspects of instructional media, school library/media programs, and instructional technology to media professionals throughout Florida and the U.S. Current circulation is approximately 1500.

The Florida Reading Quarterly. Editor, Rosie Webb Joels

The Florida Reading Quarterly is a refereed journal published four times a year by the Florida Reading Association. It is for the members of the association and all others concerned with reading, especially as it is practiced and encouraged through instruction and supervision in schools. Articles regarding theories of reading, instructional practices, research studies, materials, interviews and critiques are typical contents of the journal.

The Florida Review. Edited by Professor Patrick Rushin

The Florida Review is a biannual literary magazine produced at UCF with editorial offices in the Department of English. *The Review* showcases outstanding poetry, fiction, and criticism by both Florida writers and out-of-state writers. Ongoing features include the annual printing of the winning poems from UCF's Florida Poetry Contest, and, in each issue's Floridianna section, a bibliography of works by Florida writers. The only editorial standard is literary excellence.

Global Perspectives. Managing Editor, Dr. John C. DiPierro

Global Perspectives is the official journal of the Transnational Studies Association and is the first nonpartisan, interdisciplinary, refereed journal of international relations devoted to the publication of research by graduate students and senior undergraduates worldwide. The journal's purpose is to provide a forum for responsible, objective expression of ideas through student research in all international aspects of politics, economics, business and marketing, security, law, organization, history, development, theory and methodology, culture and language studies, education and area studies. In addition to student research, the journal contains an editor's forum, letters to the editor, a guest essay by a prominent scholar, a commentary-article by an established scholar, special notices concerning international studies, book reviews, and occasional interviews with scholars or practitioners in the field.

Hospitality Education and Research Journal. Edited by Dr. Abraham Pizam

Hospitality Education and Research Journal is an interdisciplinary journal dedicated to advancing the understanding of Hospitality education and Hospitality research through empirical investigation and theoretical developments and innovative methodologies. *Hospitality Education and Research* is directed to those concerned with the functioning of hospitality enterprises, practitioners and academics alike. It is intended to be a medium for the transmission of ideas, information and views of educators, researchers and practitioners in the hospitality industry.

Ideas in Education. Edited by Dr. Patricia C. Manning

The College of Education sponsors a refereed journal, *Ideas in Education*, which is an annual publication to provide a forum for exchanging, exploring, and researching contemporary issues in education. *Ideas in Education* is received by over 200 universities and libraries in the United States and throughout the world.

The IMPACT Study Series. Co-editors, Dr. Bradley Braun and Dr. Warren McHone

Three issues per year are published in the IMPACT Study Series. Each issue examines the impact of a major regional development (or industry) on the Central Florida economy. Funding for the series is provided by the College of Business Administration and a grant from Barnett Banks of Central Florida.

International Journal of Mathematics and Mathematical Sciences. Dr. Lokenath Debnath, Chair and Professor of Mathematics, Managing Editor of the Journal

The Mathematics Department sponsors publication of the *International Journal of Mathematics and Mathematical Sciences*. This is a quarterly refereed journal primarily devoted to publication of research in all fields of mathematical and physical sciences, as well as related fields in which mathematical treatment is significantly involved. Through editorial activities, this office provides scholarly services to the international scientific community, promotes higher study and research, and disseminates knowledge in mathematical and physical sciences while cooperating with educational and research institution and organi-

zations for the advancement of sciences and resources. In cooperation with a distinguished international editorial board, original research papers, research notes, research-expository and survey articles are processed, edited and then published.

The Journal of Reading Education. Dr. Richard A. Thompson, Editor

The Journal of Reading Education is a refereed journal of the Organization of Teacher Educators in Reading, an international association of reading professors associated with the International Reading Association. Its content features theories of reading, research into the reading process, strategies for workshops and instructional delivery to preservice and inservice teachers. Subscribers are primarily reading professors and reading program administrators.

Journal of Research on Computing in Education. Co-editors, Dr. William C. Bozeman and Dr. Dennis W. Spuck (University of Houston).

The Journal of Research on Computing in Education is an official publication of the International Society for Technology in Education (ISTE). Published quarterly, the journal presents refereed articles on original research, system or project descriptions and evaluations, assessments of the state of the art, and theoretical or conceptual positions that relate to the field of educational technology.

Journal of the Institute of Industrial Engineers. Dr. Gary E. Whitehouse, Editor, Mini/Micro Column

The editorial thrust of the *Journal of the Institute of Industrial Engineers* is directed to new developments and approaches, and new products and services for the purpose of greater productivity and efficiency and more cost effective management. *Industrial Engineering* is published monthly with applications for executives, general managers, engineers, educators, and students.

Public Administration in the 1980s. Dr. Peter W. Colby, General Editor

Public Administration in the 1980s is a series of books and monographs published by the State University of New York Press dealing with critical issues in public administration which face our nation during the decade of the 1980s. Cross-national studies, genuinely comparative work concerning national, state, and local public administration in the United States, and case studies which clearly are generalizable or which deal with issues of major significance are included. Manuscripts are reviewed by both peers and SUNY Press staff.

Social Studies Teacher. International Editor, Dr. Wentworth Clarke; Editorial Consultant, Dr. Fred Green

The *Social Studies Teacher* is a refereed professional journal published nationally and internationally by a consortium of state social studies councils affiliated with the National Council for the Social Studies. It features the activities and research of social studies professionals from throughout the United States, Canada, Great Britain, Western Europe, Japan and Australia, acting as a clearinghouse for ideas related to improving social studies substance and instruction.

Tourism Barometer. Dick Pope, Sr., Institute for Tourism Studies

The *Tourism Barometer* is a quarterly publication which contains updated tourism forecasts based on the latest state-of-the-art tourism forecasting models. Its purpose is to assist Florida's tourism industry to more effectively gauge seasonal and long-term employment needs, program advertising and promotional expenditures, establish policies for the purchasing of supplies, plan capital outlays for new facilities and expansion, manage inventories, and project tax revenues from tourism activities.

UNIVERSITY OF CENTRAL FLORIDA FOUNDATION, INC.

Chartered in 1968, the UCF Foundation, Inc., is a non-profit, tax-exempt corporation receiving and disbursing private gifts for the betterment of the University as a whole. Its primary function is to assist the University financially in the student aid program, scholarships, and institutional development.

Through the leadership of a 50-member Board of Directors, the Foundation encourages, solicits, receives, and administers gifts and bequests of property and funds for scientific, educational and charitable purposes aimed at the advancement of the University and its objectives.

The Foundation promotes and supports education by providing funds which are received from private sources. Contributions are deductible by donors as provided in Section 170 of the Internal Revenue Code.

TRAVELING SCHOLAR PROGRAM

The University participates in the Board of Regent's Traveling Scholar Program (6C-6.07) enabling a graduate student to take advantage of special resources available on another campus but not available on his own campus; for example, special course offerings, research opportunities, unique laboratories, and library collections. A traveling scholar is a graduate student who, by mutual agreement of the appropriate academic authorities in both the sponsoring and hosting institutions, receives a waiver of admission requirements and the application fee of the host institution and a guarantee of acceptance of earned resident credits by the sponsoring institution.

A traveling scholar must be recommended by his own graduate advisor, who will initiate a visiting arrangement with the appropriate faculty member of the host institution. After agreement by the student's advisor and the faculty member at the host institution, graduate deans at both institutions will be fully informed by the advisor and have the authority to approve or disapprove the academic arrangement. A student will register at the host institution and will pay tuition and/or registration fees according to fee schedules established at that institution.

Each university retains its full right to accept or reject any student who wishes to study under its auspices. A traveling scholar will normally be limited to one term on the campus of the host institution. (6-hour restriction).

A traveling scholar is not entitled to displacement allowance, mileage, or per diem payments. The home university, however, may at its option continue its financial support of the traveling scholar in the form of a fellowship or graduate assistantship with any work obligation to be discharged either at the home or at the host institution.

The Traveling Scholar form, reproduced as the UCF GS-8, must be used for documentation. This form must be completed and prior approval obtained before any course work can be taken.

DICK POPE, SR. INSTITUTE FOR TOURISM STUDIES

The Dick Pope, Sr. Institute for Tourism Studies is dedicated to improving the quality of the tourism product and increasing the benefits of tourism accruing to the industry, the state, and local community. To this end the Institute is involved in a variety of programs in the fields of research and public awareness.

The Institute's research includes the collection, development, and dissemination of information relevant to the tourism and hospitality industry. The types of research studies include (1) marketing, (2) consumer behavior and visitor satisfaction, (3) feasibility, (4) economic, (5) motivational, and (6) forecasting. Research is custom-tailored to the needs of individual enterprises, no matter how small or large they are. Some of the patrons are tourism promotion agencies at the state and local levels, tourism development commissions, professional associations, and private enterprises such as attractions, hotels, motels, food-service establishments, ground and air transportation companies, travel agencies and tour operators, and other related businesses.

The institute devotes significant efforts to increasing public awareness of the tourism industry in Florida and the entire U.S.A., and of the contribution of the industry to the social and economic welfare of the general public. Here the Institute's activities center on the production and distribution of written and audiovisual information on the value of the tourism and hospitality industry to the community.

FLORIDA SOLAR ENERGY CENTER

UCF provides administrative support to the Florida Solar Energy Center (FSEC), one of the largest renewable energy research centers in the United States. Located on 10 acres at Cape Canaveral, FSEC was created by the Florida Legislature in 1974 to advance research, development and analysis of solar technology. The Center has a highly qualified,

multidisciplinary professional staff and comprehensive facilities for research and testing of photovoltaic cells, low energy building designs, solar collectors, and domestic hot water systems. The facility also has extensive technology transfer facilities, including an energy library and an auditorium for energy workshops.

FSEC major programs include research into photovoltaics (solar-generated electricity), alternative water heating systems, ocean thermal energy conversion, energy-efficient building design, natural lighting and ventilation, and other energy conservation techniques.

CENTRAL FLORIDA RESEARCH PARK

Adjacent to and directly south of the UCF campus, is the Central Florida Research Park, where private industry and governmental agencies carry on research-oriented activities. While the first phase of the Research Park consists of 550 acres, there are additional land holdings that make it possible to expand future development to a total of almost 1,400 acres.

Four University organizations are currently located in the Research Park: the Center for Research in Electro-Optics and Lasers (CREOL), the Institute for Simulation and Training, the Sinkhole Institute, and the Small Business Development Center. The U.S. Naval Training Systems Center, the focal point of the nation's simulation and training industry, also has its headquarters in the Research Park. Currently located in the Research Park are over 65 companies pursuing activities in simulation and training, lasers, optical filters, behavioral sciences, diagnostic test equipment, and oceanographic equipment.

The Research Park, which is being developed by the Orange County Research and Development Authority in cooperation with UCF, provides greatly expanded research opportunities for faculty and graduate students, as well as additional part-time and full-time employment for students and graduates.

CENTER FOR RESEARCH IN ELECTRO-OPTICS AND LASERS (CREOL)

The Center for Research in Electro-Optics and Lasers (CREOL) was established in 1985 with the purpose of bringing together diverse disciplines into a cohesive program in optics and lasers. CREOL research activities are integrated with the instructional programs to insure involvement of student and faculty. The Florida Legislature has appropriated substantial funds to support the research and educational activities at CREOL. The bulk of these funds provide full support for 27 faculty (tenure and tenure track) positions in optics and lasers and other support personnel. The positions are being rapidly filled by top researchers/educators from around the nation. The current faculty and those being recruited span the disciplines of Electrical Engineering, Physics, Computer Engineering, Mechanical Engineering, Mathematics and other related disciplines.

The academic program involves students from various science and engineering departments. Degrees granted include the M.S. and Ph.D. in Engineering (Electrical, Mechanical, Computer), Physics, Computer Science, as well as the M.S. in Mathematics. Specialized course work in optics includes wave optics, optical design, laser principles, fourier optics, statistical optics, electro-optics, fiber optics, infrared systems, and nonlinear optics laboratory. The Cobb - L.J. Hooker Endowed Chair in Optical Sciences and Engineering was created in 1988 with the largest academic gift ever received by UCF. The chair will support the work of an internationally recognized scholar in laser and optical sciences. A number of research fellowships and graduate assistantships are available; these include the CREOL/Litton Foundation Fellowship, and numerous Research Assistantships.

CREOL research activities reflect the interdisciplinary nature of the faculty and their diverse interests. Research within the Center is supported by federal, state, and private research grants totaling over \$6 million. At present, there are sixteen CREOL faculty, fifteen Ph.D. scientists and engineers, and over forty graduate students participating in the research projects. Present research areas include laser propagation, laser/material interaction, nonlinear optics, fiber optics, optical signal processing, laser development, detector technology, ultra-fast phenomena, scattering, diffractive optics, photorefractive, thin film optics, optical waveguides, metal vapor lasers, free-electron lasers, opto-electronics, growth of nonlinear and laser host materials, superconductivity and many other topics. Over twenty state-of-the-art research laboratories support the research activities.

INSTITUTE FOR SIMULATION AND TRAINING

The Institute for Simulation and Training (IST), is located in the Central Florida Research Park next to the UCF Campus. IST conducts basic and applied research in state-of-the-art simulation and training devices. The Institute draws on the expertise of faculty and the academic resources of the University of Central Florida, the Naval Training Systems Center, the Army Project Manager for Training Devices, and the Department of Defense Training and Performance Data Center. The Institute also maintains close ties with many industrial affiliates in the private sector.

The Institute's research encompasses a wide variety of areas related to simulation and training. These areas include simulation/gaming, special purpose computer architecture, software engineering, computer-generated imagery systems, human factors engineering, instructional systems design, technical/instructional writing, operations research, computer-based instruction, and artificial intelligence.

RESEARCH AND SCHOLARLY ACHIEVEMENTS

Begun in 1982, the annual publication of *Research and Scholarly Achievements* lists the scholarly activities at UCF. The publication highlights the contributions to scholarship by the UCF faculty.

A committee of faculty members set up the original guidelines for material to be included. A rule of thumb used for inclusion in all but the last section of the report was that the written, or oral, scholarly activity be prepared for an audience of professional peers on a subject in one's area of professional expertise. Many other worthwhile activities have been incorporated in the last section.

QUILL

The Quill is a select club on the UCF campus which was organized in 1982 to recognize and honor faculty of the University who are authors of one or more books. Criteria of eligibility have been set up by the faculty, and there is an induction of new members at the annual meeting.

SCROLL

The Scroll is a select club on the UCF campus which was organized in 1987 to recognize and honor faculty of the University who have shown sustained research activities.

Criteria of eligibility based upon a significant number of peer-reviewed articles in international and national journals have been set up by the faculty. Evaluation of nominees is done by a faculty committee and new members are inducted annually.

UCF PRESS

The University Presses of Florida (UPF) is a single press representing the Florida System. Each of the nine universities within the UPF has its own imprimatur and editorial board. The emphasis at the UCF Press is on its poetry series and on its Florida History and Science series.

CAMPUS AND GRADUATE SCHOOL CALENDAR

SUMMER TERMS 1991			
	Term "C" 1991	Term "A" 1991	Term "B" 1991
APPLICATION DEADLINES			
For International Students	Feb. 1	Feb. 1	Feb. 1
For U.S. Post-baccalaureate Students	April 12	April 12	June 7
Readmission Applications	April 12	April 12	June 7
TRANSCRIPT DEADLINE			
For International Students	Feb. 27	Feb. 27	Feb. 27
REGISTRATION by appointment*			
Classes begin	May 9-10	May 9-10	June 25
Last day for refund of fees	May 13	May 13	June 26
Last day of late registration, Add/Drop	May 15	May 16	June 28
Only day to submit audit request	May 15	May 15	June 28
Last day to apply for graduation	May 16	May 16	July 1
Deadline for withdrawal	May 17	May 17	June 28
Last day to remove an "I"	June 21	May 31	July 12
End of classes and term; exams	July 12	July 12	July 19
Grades Due	Aug. 7	June 24	Aug. 7
	Aug. 12	June 27	Aug. 12
GRADUATE STUDIES DEADLINES			
Request for Dissertation Defense	June 24		
Announcement of Dissertation Defense	(One week prior to defense)		
Dissertation Defense Deadline	July 19		
Announcement of Thesis/Research Report Defense	(One week prior to defense)		
Thesis Defense Deadline	July 26		
Final thesis/dissertation/research report to College Dean	Aug. 2		
GRE—General Test Dates			
			June 1, 1991
GMAT Test Dates			
			June 15, 1991
Registration deadline for tests is approximately five weeks before test; results are generally mailed about five weeks after the test date.			
Deadline for obtaining graduate status for Summer 1991 is June 3.			
HOLIDAYS: Memorial Day — May 27, 1991 (University wide)			
Independence Day — July 3, 1991 (University wide)			
*Area campus students must contact the director of Brevard, Daytona Beach, or South Orlando campus. Deadlines for registration and Add/Drop may precede main campus dates and may vary with individual campuses.			

1991		
JULY	AUGUST	SEPTEMBER
S M T W T F S	S M T W T F S	S M T W T F S
1 2 3 4 5 6	1 2 3	1 2 3 4 5 6 7
7 8 9 10 11 12 13	4 5 6 7 8 9 10	8 9 10 11 12 13 14
14 15 16 17 18 19 20	11 12 13 14 15 16 17	15 16 17 18 19 20 21
21 22 23 24 25 26 27	18 19 20 21 22 23 24	22 23 24 25 26 27 28
28 29 30 31	25 26 27 28 29 30 31	29 30
OCTOBER	NOVEMBER	DECEMBER
1 2 3 4 5	1 2	1 2 3 4 5 6 7
6 7 8 9 10 11 12	3 4 5 6 7 8 9	8 9 10 11 12 13 14
13 14 15 16 17 18 19	10 11 12 13 14 15 16	15 16 17 18 19 20 21
20 21 22 23 24 25 26	17 18 19 20 21 22 23	22 23 24 25 26 27 28
27 28 29 30 31	24 25 26 27 28 29 30	29 30 31

1992		
JANUARY	FEBRUARY	MARCH
S M T W T F S	S M T W T F S	S M T W T F S
1 2 3 4	1	1 2 3 4 5 6 7
5 6 7 8 9 10 11	2 3 4 5 6 7 8	8 9 10 11 12 13 14
12 13 14 15 16 17 18	9 10 11 12 13 14 15	15 16 17 18 19 20 21
19 20 21 22 23 24 25	16 17 18 19 20 21 22	22 23 24 25 26 27 28
26 27 28 29 30 31	23 24 25 26 27 28 29	29 30 31
APRIL	MAY	JUNE
1 2 3 4	1 2	1 2 3 4 5 6
5 6 7 8 9 10 11	3 4 5 6 7 8 9	7 8 9 10 11 12 13
12 13 14 15 16 17 18	10 11 12 13 14 15 16	14 15 16 17 18 19 20
19 20 21 22 23 24 25	17 18 19 20 21 22 23	21 22 23 24 25 26 27
26 27 28 29 30	24 25 26 27 28 29 30	28 29 30
	31	

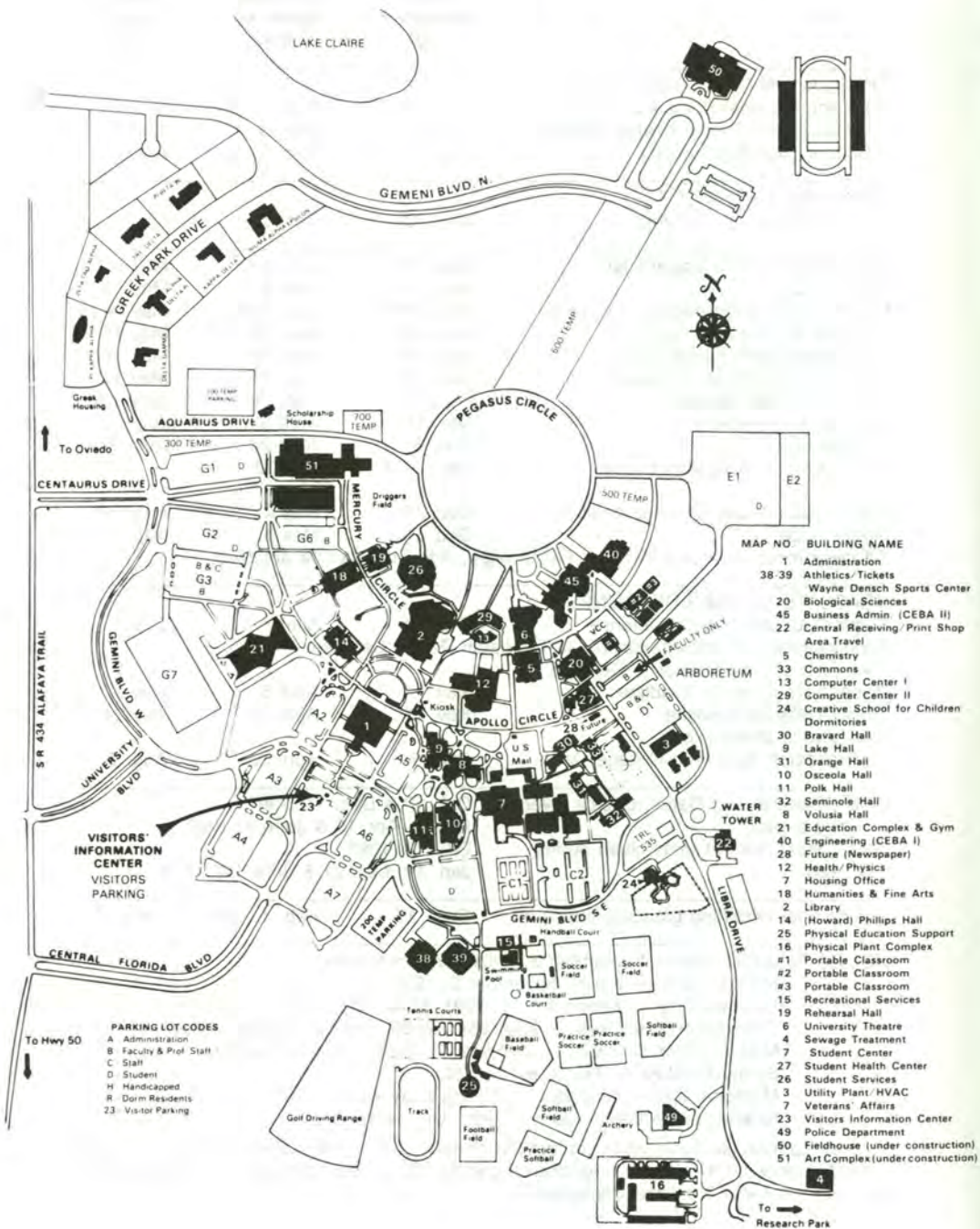
CAMPUS AND GRADUATE SCHOOL CALENDAR

	FALL Semester 1991	SPRING Semester 1992	SUMMER Term "C" 1992
APPLICATION DEADLINES			
For International Students	March 29	Aug. 31	Nov. 25
For U.S. Post-baccalaureate Students	July 19	Dec. 3	April 1
Readmission Applications	July 19	Dec. 3	April 1
TRANSCRIPT DEADLINE			
For International Students	May 30	Oct. 31	April 1
REGISTRATION by appointment*			
Classes begin	Aug. 14-17	Jan. 2-4	May 9-10
Last day of late registration, Add/Drop**	Aug. 21	Jan. 6	May 13
Last day for refund of fees	Aug. 22-27	Jan. 8-10	May 14-15
Only day to submit audit request	Aug. 27	Jan. 10	May 15
Last day to apply for graduation	Aug. 28	Jan. 13	May 18
Deadline for withdrawal	Aug. 24	Jan. 11	May 17
Last day to remove an "I"	Oct. 18	Feb. 28	June 26
Classes end	Nov. 15	April 3	July 10
Final exams and Special Exams	Dec. 6	April 24	Aug. 7
	Dec. 9-14	Apr. 22- May 2	
End of Term and/or Commencement	Dec. 16	May 4	Aug. 10
Grades Due	Dec. 18	May 5	Aug. 11
**If class meets first time Wed. or Thurs. night, Add/Drop can be adjusted.			
GRADUATE STUDIES DEADLINES			
Request for Dissertation Defense	Oct. 29	March 18	July 1
Announcement of Dissertation/Thesis/Research Report Defense:			
At least one week prior to Defense			
Dissertation Defense deadline	Nov. 14	April 5	July 17
Thesis Defense deadline	Nov. 21	April 12	July 24
Final thesis, dissertations or research reports to College Dean	Dec. 5	April 26	Aug. 7
GRE—General Test Dates (5 tests given during a year)			
	Oct. 12 & Dec. 14, 1991		
	Feb. 1, Apr. 11 & June 6, 1992		
GMAT Test Dates (4 tests given during a year)			
	Oct. 19, 1991		
	Jan. 18, Mar. 21 & June 20, 1992		
Deadline for obtaining graduate status is	Sept. 17	Feb. 4	June 10
HOLIDAYS: Labor Day — September 2, 1991 (University wide)			
Homecoming — 7 p.m. November 2, 1991			
Veterans Day — November 11, 1991 (University wide)			
Thanksgiving Holidays — November 28-29, 1991 (University wide)			
Martin Luther King Day — January 20, 1992 (University wide)			
Spring Holidays — March 9-14, 1992			
Memorial Day — May 25, 1992 (University wide)			
Independence Day — July 3, 1992 (University wide)			

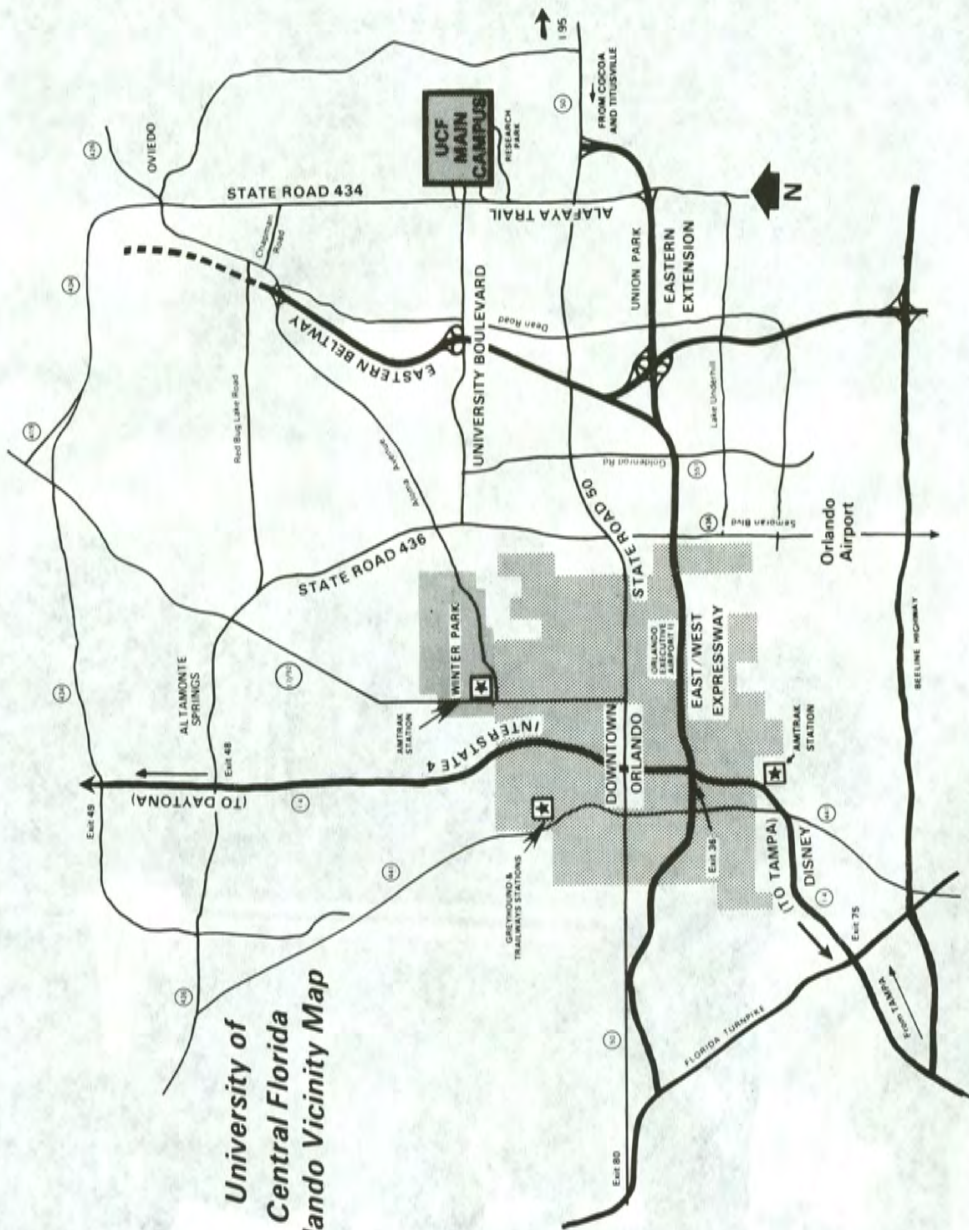
*Area campus students must contact the director of Brevard, Daytona Beach or South Orlando campus. Deadlines for registration and Add/Drop may precede main campus dates and may vary with individual campuses.

Campus Map

(407) 823-2000



University of Central Florida Orlando Vicinity Map



Suggested Routes:
 To Daytona: Exit 48 on I-4 from Daytona. Exit Route 436 (Altamonte Springs) to University Blvd.
 To Tampa: Exit 36 on I-4 from Tampa. Exit East-West Expressway (Toll) and East to Route 434.

From intersection of I-4 and E.W. Expressway to Hwy. 434 11 miles
 From intersection of Hwy. 50 and Hwy. 434 to Campus 2 miles
 From Orlando International Airport 20 miles
 From Orlando Executive Airport 7 miles



ADMISSION TO THE UNIVERSITY AND GRADUATE STUDIES

Working with the Registrar, whose function is to process and insure completeness of records, the program coordinator and the dean of the college admit the prospective student to graduate study in the area for which he or she is applying. It should be noted that post-baccalaureate admission to UCF does not guarantee admission to graduate status in a degree program.

ADMISSION PROCEDURE AND DOCUMENTS

APPLICATIONS

Applications for admission to the University for degree-seeking or non-degree-seeking (post-baccalaureate) study may be obtained from the Graduate Admissions Office. Completed applications must be submitted to the same office.

UCF students who graduate with a baccalaureate degree and wish to continue their studies here must file an application for admission to either the graduate degree program or for non-degree (post-baccalaureate) admission. No fee is required of returning UCF students who have previously paid an application fee.

ACCREDITATION

For the purposes of this catalog, "accredited institutions" means those institutions accredited by the six regional associations:

- New England Association of Schools and Colleges
- Middle States Association of Colleges and Secondary Schools, Commission on Institutions of Higher Education
- North Central Association of Colleges and Schools, Commission on Colleges and Universities
- Northwest Association of Secondary and Higher Schools, Commission on Higher Schools
- Southern Association of Colleges and Schools
- Western Association of Schools and Colleges, Accrediting Commission for Senior Colleges and Universities and Accrediting Commission for Junior Colleges

Foreign institutions are evaluated by UCF.

OFFICIAL TRANSCRIPTS

To be granted admission to UCF in either graduate or post-baccalaureate status, all applicants must have on file in the Registrar's Office official transcripts showing a baccalaureate degree and the grades for the last 60 semester hours of undergraduate work. Final acceptance into degree-seeking graduate status is not granted unless an applicant's official transcripts and necessary test scores are on file so that they can be evaluated for admission.

GRADUATE EXAMINATIONS

The Board of Regents of the State of Florida requires every student to take either the Graduate Record Exam (GRE) or the Graduate Management Admission Test (GMAT) before the student can be transferred from post-baccalaureate status to graduate student status. Some programs may also require the GRE subject test before admission into graduate student status. Official copies must be mailed from the Educational Testing Service to the Graduate Admissions Office and be on file before graduate student status can be granted. UCF recommends that any individual contemplating class work beyond the bachelor's degree take the GRE or GMAT at the earliest possible date to avoid problems associated with a delay of acceptance into a graduate program. The GRE is given five times a year and the GMAT is given four times a year on the UCF main campus. An individual should contact the UCF Counseling and Testing Center for registration dates and procedures.

Educational Testing Service began a new policy, effective with the October 1985 GRE test, of reporting scores only until September 30 following the fifth anniversary of the test date.

If ETS cannot provide an official copy, students will need to repeat the GRE and have an official score reported to UCF. However, the established time limit of acceptable official test scores varies with programs at UCF, as shown below:

Arts and Sciences

Biology	5-year limit
Chemistry, Industrial	No limit
Communication	No limit
Computer Science	No limit on General test, but a 2-year limit on the GRE Computer Science Subject Test.
English	No limit
History	No limit
Mathematical Sciences	5-year limit
Physics	No limit
Political Science	No limit
Psychology	5-year limit
Public Administration	5-year limit
Sociology, Applied	7-year limit
Statistical Computing	5-year limit

Business Administration programs have no limit on the GMAT score unless it is below 550 on a score over 5 years old. GRE scores for the Applied Economics degree program have a 5-year limit.

Education programs have no limit.

Engineering programs have no limit.

Health & Public Affairs

Communicative Disorders	7-year limit
Health Sciences	7-year limit

INTERNATIONAL STUDENTS

UCF adheres to the principle that the University is primarily a community of scholars, both national and international, in pursuit of knowledge, and active in teaching, studying, and doing research. The presence of international students on the campus contributes substantially to the quality of the educational experience for everyone. It can bring to the classroom learning environment unique viewpoints and perceptions which would otherwise be lost to the U.S. students. Effective personal contact across cultures can reduce errors in understanding one another's problems and foster a climate of international peace and cooperation among people of the world today.

The international student must submit the Test of English as a Foreign Language (TOEFL) score, as well as transcripts, if the student is not a graduate from an accredited college or university in the United States. When the official test score is received in the Admissions Office, copies will be sent to the graduate program coordinator who evaluates the student's record, the undergraduate institution, and the student's test score.

Each program has determined what minimum TOEFL score will be required, as shown below:

PROGRAM	TOEFL
College of Arts and Sciences	
Biology	550
Chemistry, Industrial	500
Communication	550
Computer Science	550
English	575
History	575
Mathematical Science	500

Physics	550
Political Science	500
Psychology	500
Public Administration	550
Sociology, Applied	500
Statistical Computing	500
College of Business Administration	575
College of Education	550
College of Engineering	550
College of Health and Public Affairs	500

The Graduate Admissions Office of the University of Central Florida evaluates international student documents. International students must have official copies of all transcripts sent to Graduate Admissions along with a certified English translation of the transcripts. Additional information may be required to clarify a transcript; the student will be notified of such requirements. The following programs require only document evaluation: Computer Science, English, Health, Mathematical Science, Political Science and Statistical Computing. All other departments require course-by-course evaluations. Students must adhere to deadlines published in the catalog.

International students are not eligible for post-baccalaureate status unless they hold a baccalaureate degree from a regionally accredited United States university.

RECORDS DEADLINE - Supporting Documents

All supporting admissions documents (e.g., transcripts and test scores not recorded on official transcripts) should be received by the Admissions Office no later than 15 days preceding the first day of classes. In some cases, applicants may be allowed to register on a temporary basis (without all records) assuming it can be determined from available records or consultation with the students that they appear admissible.

RECORDS - Validity of Documents

All supporting admissions documents must be received directly from the issuing institution or testing agency, and if the University finds that an applicant has made a false or fraudulent statement or a deliberate omission on the application, residency affidavit, health report, or any accompanying document or statement, that applicant may be denied admission. Should the student be enrolled when such fraud is discovered, he or she may be immediately withdrawn (with no refund), further enrollment denied, and credit earned and any degree based upon such credit invalidated. Actions for this type of offense will be handled administratively by the University Registrar's Office after notification to the alleged violator and hearing by that office.

MEDICAL HISTORY REPORT

All new students must furnish medical history reports on the approved University health form before registration will be allowed. The Medical History Report will be mailed to the applicant upon receipt of the application for admission.

Immunizations and diagnostic procedures may be required of students by the University prior to any registration. University requirements for vaccinations or immunizations may be waived upon receipt of appropriate documentation from the student that the waiver is requested on the basis of religious grounds or upon the recommendation of a University physician.

Where physician examinations or certificates are required, they must be signed by a doctor of medicine or by a doctor of osteopathy. The University reserves the right to refuse registration to any student whose health record or report of medical examination indicates the existence of a condition which may be harmful to members of the University community.

REACTIVATION OF A STUDENT'S FILE

A student who has submitted an application for admission to the University of Central Florida, but never attended, may reactivate the original application within a period of two years. (No additional fee is required.) Please check current catalog for deadline date.

ADMISSION TO THE UNIVERSITY

ADMISSION PROCESS

Admission to the University does not imply admission to graduate status.

The admission process begins with the receipt of the application with fee at the Admissions Office. The Admissions Office acknowledges receipt of the application and fee and notifies the applicant of any deficiencies in the application (e.g., transcripts, GRE or GMAT test scores, etc.).

The application information is then forwarded to the degree program. Upon receipt, copies of transcripts and test scores are also forwarded to the degree program.

Applicants will receive their initial notice of acceptance to the University as non-degree seeking students and information for registration for classes from the Admissions Office. All inquiries for degree program information should be directed to the program coordinator or the department chair.

READMISSION TO THE UNIVERSITY

A regularly admitted student who has not been registered for two major semesters (Spring/Fall) must make application for readmission through the Admissions Office approximately one month before classes begin for the new semester. (See "Continuous Attendance" below.)

CONTINUOUS ATTENDANCE

Graduate students should be aware of two policies regarding continuous attendance at the University. The first may affect continuing status as a graduate student. The second affects the student's option to fulfill degree requirements under any UCF catalog in force during the student's most recent period of continuous attendance.

1. A student may not be guaranteed continuing graduate status if he or she does not enroll in the University for a period of three consecutive semesters *including summer*. When a student applies for readmission, after having been out three or more semesters, the program will review the student's record to determine if he or she will be continued in graduate status or be reverted to post-baccalaureate status.
2. Graduation policy allows a student to fulfill degree requirements as listed in the UCF catalog in force during the student's most recent period of continuous attendance. Continuous attendance is interrupted when a student drops out of school for any term other than the summer term. Because students must occasionally interrupt their attendance for a brief period, a student will be considered to have interrupted continuous attendance only if the interruption is for three or more consecutive terms including summer. Under these circumstances, a student will lose the option of fulfilling degree requirements under earlier catalogs.

WITHDRAWAL POLICY

A student may withdraw from a class up to the end of the eighth week of any regular academic semester or until the midpoint of any summer term. No withdrawal after the deadline is permitted except in extraordinary circumstances. Students who need to petition for withdrawal after the deadline should contact the Office of the Dean of their college.

A student is never automatically withdrawn from a class by not attending. Failure to officially withdraw from a class will result in a grade of "F." Course withdrawal forms are available in the Records Office (normally open until 7:00 p.m. Monday through Thursday, and until 5:00 p.m. on Friday).

Upon request, the instructor will provide the student with an assessment of his or her performance in the course prior to the last day for withdrawal.

ADMISSION TO A GRADUATE PROGRAM

Upon receiving copies of all transcripts and standardized test information from the Admissions Office, the degree program coordinator will recommend denial or admittance on REGULAR or PROVISIONAL degree-seeking graduate status.

APPEALS PROCEDURE FOR REJECTED STUDENTS

Students who are rejected by a program but who meet the SUS minimum standards for admission to graduate status are allowed under Rule 6C-6.03 to appeal that decision. Those applicants may request reconsideration by written petition to the University within

thirty days of the date of denial. The route of appeal will be first to the college dean and then to the Graduate Council for recommendation to the Provost.

ADMISSION CLASSIFICATIONS

Admission to graduate status can be in either of two categories: regular status or provisional status. (Post-baccalaureate status is considered non-degree-seeking.)

GRADUATE STATUS—REGULAR

The minimum system-wide requirements of the Board of Regents for admission to REGULAR graduate status are listed below. Additional requirements are specified by individual degree programs. All students who wish degree-seeking status must submit the GRE General Test score (or the GMAT score as required). Some programs also require the GRE Subject Test. Other programs may require a minimum GRE General Test score.

- (1) A baccalaureate degree or equivalent from a regionally accredited university and an earned GPA of 3.0 or more (on a 4.0 maximum) while registered as an upper-division undergraduate student (normally based on the last sixty semester hours) or a total score of 1,000 or higher on the General Test (quantitative-verbal sections) of the Graduate Record Examination (or a GMAT score of 500 or higher as needed) or an equivalent score on an equivalent measure approved by the Board of Regents OR a previous graduate degree and official GRE or GMAT score.

Even though an applicant may qualify for minimum admission on the basis of the undergraduate grade point average or having a previous graduate degree, an official GRE or GMAT score must be on file before consideration for admission to Graduate Status.

- (2) A student must be accepted by the program coordinator and the dean of the college offering the particular degree program sought. Requirements in addition to the minimums stated above may be specified by the individual degree programs.
- (3) International students must demonstrate their proficiency in the English language as one of the conditions of admission. All international applicants whose primary language is not English and who have not earned a degree from an accredited American college or university, must take the TOEFL (Test of English as a Foreign Language). Evaluations of the TOEFL score will reside with the program coordinator.

The Graduate Admissions Office of the University of Central Florida evaluates international student documents. International students must have official copies of all transcripts sent to Graduate Admissions along with a certified English translation of the transcripts. Additional information may be required to clarify a transcript; the student will be notified of such requirements. The following programs require only document evaluation: Computer Science, English, Health, Mathematical Science, Political Science and Statistical Computing. All other departments require course-by-course evaluations. Students must adhere to deadlines published in the catalog.

GRADUATE STATUS—PROVISIONAL

A student who does not fulfill the academic conditions for REGULAR admission may be admitted provisionally upon recommendation of the dean of the college to which admission is sought.

PROVISIONAL admissions may at no time exceed 10 percent of the graduate students admitted for any academic year in any single degree program.

PROVISIONAL students may be admitted to REGULAR status following satisfactory completion of 9 semester hours and upon recommendation by the program coordinator and college dean. If a student does not maintain a 3.0 GPA in the graduate program of study, he or she will be placed on ACADEMIC PROVISIONAL status for 9 semester hours; then reverted to post-baccalaureate status if the GPA is still unsatisfactory. However, a student with regular or provisional status whose overall GPA falls below 2.0 will be reverted to post-baccalaureate status.

POST-BACCALAUREATE STATUS

Post-baccalaureate status is considered to be non-degree-seeking. A student is placed in this category for computer records when the application is received. If a student wishes to be degree-seeking, he or she must have official GRE or GMAT test scores sent to the Graduate Admissions Office, along with official transcripts. The graduate program evaluates these documents and makes a decision on admissibility to graduate status. International students are not eligible for post-baccalaureate status unless they hold a baccalaureate degree from a regionally accredited United States university.

A student may elect to remain in post-baccalaureate status for various reasons (e.g., requirements in a graduate program at another institution, personal improvement, meeting job requirements, and removing academic deficiencies). While in this category, a student is allowed to take graduate courses on a space-available basis only. Also while graduate status students register the first days of registration, post-baccalaureate students register the last day. Furthermore, not all departments accept post-baccalaureate students. For those departments which do accept post-baccalaureate students, the procedures for enrollment into graduate level classes vary with each department. In some cases, a department will control enrollment by closing graduate courses after the scheduled registration time for graduate status students, and then admit non-degree-seeking students only by special permission.

All students who take course work while in post-baccalaureate status should be aware of the limit of 9 semester hours of course work which can be transferred into a graduate degree program when a student is given graduate status.





CHANGE OF MAJOR OR COLLEGE

When a student requests a change of major or college after having been admitted to a graduate program, the old program shall send the student to the new program. The new program coordinator will then admit the student to the new program as a graduate student or change him or her to post-baccalaureate status, whichever is appropriate. Changes of majors for post-baccalaureate students are submitted by the college on a University change of major form.

DISMISSAL FROM THE GRADUATE PROGRAM

Students who fail to maintain satisfactory academic performance shall be reverted to post-baccalaureate status by the program or college Dean. In addition to unsatisfactory grades, other reasons for reverting a student to post-baccalaureate status include weak academic performance in the major field of endeavor, or poor performance in required examinations (e.g., end-of-the-program examination or thesis defense).

The student may appeal such a dismissal through the college to the Graduate Council. Only in exceptional cases shall the student be readmitted to the program by the Graduate Council. In such cases, the student's entire program shall be re-evaluated and a new program will be submitted for consideration by the Graduate Council. It is entirely possible that additional courses will be required in the program of study before the student is allowed to continue in the graduate program.

SECOND MASTER'S DEGREE

Completion of one master's program at UCF may qualify a student for a second master's degree. Individuals seeking a second master's degree must complete the normal UCF master's degree requirements for the second degree.

Up to 6 semester hours from a completed master's program from UCF or any other institution may be transferred into a second master's program if the courses are not more than seven years old when the second degree is completed.



CHANGE OF MAJOR ON COLLEGE

When a student wishes to change his major, he should first consult with his advisor. The advisor will help the student understand the requirements for the new major and the impact it will have on his graduation date. The student should also consult with the department chair of the new major to ensure that he meets all the necessary prerequisites. Once the student has decided on a new major, he should submit a change of major form to the registrar's office. This form should be completed by the student and signed by his advisor and the department chair. The registrar's office will then process the change and update the student's academic record.

REPEL FROM THE GRADUATE PROGRAM

Students who find themselves struggling academically in their graduate program should first consult with their advisor. The advisor will help the student identify the reasons for their struggles and provide them with strategies to improve their performance. The student should also consider taking a break from the program if they feel overwhelmed. If the student decides to continue in the program, they should seek out additional support, such as tutoring or counseling. The student should also consider reaching out to their peers for support. If the student is still struggling, they should consider withdrawing from the program. This decision should be made in consultation with their advisor and the department chair. The registrar's office will process the withdrawal and provide the student with a transcript reflecting the withdrawal.

GRADUATE ACADEMIC RECORD

The graduate academic record is a record of a student's academic performance in their graduate program. It includes information about the student's coursework, grades, and any awards or honors they have received. The record is maintained by the registrar's office and is used to determine a student's eligibility for graduate-level courses and programs. The record is also used to provide information about a student's academic progress to their advisor and the department chair. The student should review their record regularly to ensure that it is accurate and to identify any areas where they need to improve their performance.

FEE INFORMATION

A student's basic expenses at the University will be for tuition, fees, room and board (if used), textbooks and other instructional supplies, and miscellaneous items.

Required fees are established by the Board of Regents and the Florida State Legislature, which meets in late spring of each year. Fees are subject to change without notice.

GENERAL FEES AND COSTS

Application Fee\$15.00

A nonrefundable fee is required with all applications for admission to the University.

Registration Fees

Registration fees are listed below for courses on the main campus, area campuses, and for continuing education courses. Minimum registration of one credit hour (at the level at which the student is classified) must be charged for students registering for zero hours (co-op students on work assignment, applicants for graduation during a semester that a student is not registered, etc.).

All Semesters, 1991-92

Undergraduate Level Credits

Resident

\$49.16/hour

Non-Resident

\$187.11/hour

Graduate Level Credits

86.78/hour

289.19/hour

Thesis and Dissertation Credits

86.78/hour

289.19/hour

Undergraduate courses are numbered 0-4999.

Graduate courses are those numbered 5000-6999, 7000 and above.

Thesis courses are numbered 6970-6973; Doctoral dissertation courses are numbered 7917 and 7980.

Student Health Fee (not refundable)

Fall and Spring Semesters\$41.00

Summer Semester\$31.00

The student health fee is assessed of all students except those enrolled exclusively in continuing education courses. The fee must also be waived for employees under the fringe benefit plan and for Intern Participation Certification holders. (University employees who use the Tuition Fee Waiver for class attendance may NOT elect to pay the fee, regardless of the number of hours taken.)

Late Registration Fee\$25.00

This non-refundable fee is required of students who register during the late registration periods or fail to pay full fees by the established deadline.

Student Vehicle Registration, per calendar year\$36.00

This fee is required of everyone (including full-time, part-time, and courtesy students) operating a motor-powered vehicle on campus.

Room/Board Plans (Several optional food service plans are available.)

Dormitory room per semester\$810-\$1,080

Charge for late payment\$25.00

Board (meal plans) per semester\$548-\$984

Intern Participation Holder\$4.76/hr.

I.D. Card Replacement\$5.00

REFUND OF FEES

A refund of fees will be made under certain conditions upon presentation of a Certification of Withdrawal issued by the Registrar to the Student Accounts Office.

- A. A full refund will be issued under the following circumstances:
 - 1. Withdrawal is made before the end of the add/drop period. Summer refunds will not be made until after Term B registration and drop/add, except by written application to Student Accounts, Room 112, Administration Building.
 - 2. The course is cancelled by the University.
 - 3. A student is withdrawn from a course by the University for whatever reason.
- B. A partial refund (25% of the total fees paid, less building and capital improvement fees) will be made when complete withdrawal from the University is made prior to the end of the fourth week of classes during a 16/17 week semester, or at the end of the first quarter of the term during a mini-semester or summer semester (rounded out to the end of the week in which the first quarter occurs).
- C. Refunds may be made for exceptional circumstances at any time upon withdrawal from one or more courses. Up to 100% of tuition and registration fees may be refunded under circumstances determined by the University to be exceptional, including, but not limited to, sickness, death, involuntary call to military service, or administrative errors created by the University.

TUITION FEE WAIVERS FOR STATE OF FLORIDA EMPLOYEES

State employees, faculty, and staff who utilize a tuition fee waiver for course work without payment of the registration fees must register on the day and time provided by the Registrar. Employees who register prior to the prescribed time and date will have an invalid fee waiver, and will be liable for all applicable fees on courses enrolled. It is the responsibility of the employee to register only on a space available basis, and this is only during the prescribed time as indicated above by the Registrar. In addition, the tuition fee waiver cannot be used for courses which require increased costs (as it does for such courses as Thesis, Dissertation, Directed Individual Study, etc.).

TUITION FEE WAIVERS FOR SENIOR CITIZENS

Persons 60 years of age or older who meet Florida residency requirements may register for credit classes without payment of application fee, registration fee and health fee. It is the responsibility of the senior citizen, however, to register only on a space available basis; and this is only during the last hour of the Add/Drop registration period prescribed by the Registrar. No academic credit shall be awarded, and the waiver cannot be used for courses which require increased costs. This would include, but not be limited to, Thesis, Dissertation, and Directed Individual Study.

FINANCIAL AID OFFICE

Programs administered by the Financial Aid Office include long-term loans and institutional emergency short-term loans. On-campus employment is also available. Information and application forms for out-of-state tuition waivers and teaching or research assistantships are available through the various colleges.

APPEALS

Students who wish to appeal denial of deferment, refund, or waiver should initiate a student petition form 41-561 and submit it to the Committee for Resolving Fee Payment Questions. Form 41-561 may be obtained from the Undergraduate Studies Office, Student Affairs, University Cashier, or Student Accounts and should be returned to Student Accounts, Room 112, Administration Building. The students must then submit their petition to Student Accounts, Room 112, Administration Building, and may appear (not mandatory) before the committee, which meets once each week. Time, date, and place are subject to change.

PAST DUE ACCOUNTS

Any, and all, financial obligations to the University must be met by the student if "good standing" is to be maintained. Failure to meet such obligations can result in the withholding of grades and transcripts, and denial of registration and readmission to the University. The services of a professional collection agency and recourse to the courts may also be invoked if deemed necessary by the University Controller. All costs of collection, including attorney's fees, shall be borne by the debtor.

FLORIDA RESIDENCY REQUIREMENT

To qualify as a Florida Resident for tuition purposes you must:

Be a U.S. Citizen, Resident Alien (status must be approved one year prior to the beginning of classes), parolee, Cuban National, Vietnamese Refugee, holder of a valid A, E, G, I or K visa, or other Refugee or asylee so designated by the U.S. Immigration and Naturalization Service,

AND

Have established a legal residence in this State and physically maintained that legal residence for twelve (12) consecutive months immediately prior to the term in which you are seeking Florida resident classification. Your residence in Florida must be as a bona fide domiciliary rather than for the purpose of maintaining a mere temporary residence or abode incident to enrollment in an institution of higher education, and should be demonstrated as indicated below (for dependent students as defined by IRS regulations, a parent or guardian must qualify),

AND

Submit the following documentation (or in the case of a dependent student, the parent must submit documentation) prior to the last day of registration for the term for which resident status is sought:

1. Documentation establishing legal residence in Florida (this document must be dated at least one year prior to the first day of classes of the term for which resident status is sought). The following documents will be considered in determining legal residence:
 - a. Declaration of Domicile.
 - b. Proof of purchase of a home in Florida which you occupy as your residence.
 - c. Proof that you have maintained residence in the state for the preceding year (e.g., rent receipts, employment records).
2. Documentation establishing bona fide domicile in Florida which is not temporary or merely incident to enrollment in a Florida institution of higher education. The following documents will be considered evidence of domicile even though no one of these criteria, if taken alone, will be considered as conclusive evidence of domicile:
 - a. Declaration of Domicile.
 - b. Florida voter's registration.
 - c. Florida vehicle registration.
 - d. Florida driver's license.
 - e. Proof of real property ownership in Florida (e.g., deed, tax receipts).
 - f. Employment records or other employment-related documentation (e.g., W-2, paycheck receipts), other than for employment normally provided on a temporary basis to students or other temporary employment.
 - g. Proof of membership in or affiliation with community or state organizations or significant connections to the State.
 - h. Proof of continuous presence in Florida during periods when not enrolled as a student.
 - i. Proof of former domicile in Florida and maintenance of significant connections while absent.
 - j. Proof of reliance upon Florida sources of support.
 - k. Proof of domicile in Florida of family.
 - l. Proof of admission to a licensed practicing profession in Florida.
 - m. Proof of acceptance of permanent employment in Florida.
 - n. Proof of graduation from high school located in Florida.
 - o. Any other factors peculiar to the individual which tend to establish the necessary intent to make Florida a permanent home and that the individual is a bona fide Florida resident, including the age and general circumstances of the individual.

3. No contrary evidence establishing residence elsewhere.

4. Documentation of dependent/independent status (notarized copy of IRS tax return).

OR

Be married to a person who has been a legal resident for the required twelve-month period, and has met the above criteria,

OR

Be a member of the Armed Forces on active duty stationed in Florida, or a spouse or dependent,

OR

Be a member of the full-time instructional or administrative staff of a state public school, community college or university in Florida, a spouse or dependent,

OR

Be a dependent and have lived (5) five years with an adult relative who has established legal residence in Florida,

AND

File a notarized Residence Affidavit with the Admissions Office.

For specific requirements of RECLASSIFICATION, please refer to the information sheet available in the Admissions Office.

The Admissions Office reserves the right to require additional documentation as deemed necessary to accurately determine the residence status of any student.

ORGANIZATION OF GRADUATE STUDIES

The Office of Graduate Studies is responsible for the establishment and subsequent monitoring of minimum University-wide standards concerning graduate admission and matriculation. It also coordinates the graduate programs of the various colleges of the University, although responsibility for the detailed operation of the various graduate programs is vested in the individual colleges.

THE GRADUATE COUNCIL

The Graduate Council is an advisory body to the Vice President for Academic Affairs (Provost). Its functions are to:

Recommend minimum university standards for admission to graduate programs and for granting graduate degrees.

Review and make recommendations concerning all proposed new graduate programs.

Act as the graduate curriculum committee to review and make recommendations to the Vice President for Academic Affairs concerning proposed new graduate courses; review and make final decisions on graduate course revisions and course deletions.

Review and make recommendations concerning existing graduate programs at least every five years; review and make recommendations on the current operating procedures of all graduate programs.

Review and make recommendations concerning appeals (by petition) from students for exceptions to University policies or admission decisions.

DOCTORAL PROGRAM SUBCOMMITTEE

A Doctoral Programs Subcommittee is established for the general advocacy of doctoral programs throughout the University community and to review, determine, and recommend policies for doctoral programs to the Graduate Council. Membership consists of the chair appointed by the Provost, one representative from each doctoral program, and one member elected from the Graduate Council.

GRADUATE PROGRAMS

UCF Authorized Graduate Degree Programs and Coordinators				
Degree	Program	Coordinator	Phone	Room
Arts and Sciences				
M.S.	Biology	Dr. Kuhn	823-2917	BIO 210
M.S.	Chemistry, Industrial	Dr. Elsheimer	823-2246	CHM 332
M.A.	Communication	Dr. Pryor	823-2681	HFA 528A
M.S. & Ph.D.	Computer Science	Dr. Dutton	823-2341	CC II 206
M.A.	English	Dr. Barnes	823-2212	HFA 433
M.A.	History	Dr. Kallina	823-2224	HFA 505A
M.S.	Mathematical Science	Dr. Andrews	823-2418	PH 409
M.Sd. Ph.D.	Physics	Dr. Caldwell	823-2325	HPB 310
M.A.	Political Science	Dr. Pollock	823-2608	HFA 430
M.S.	Psychology, Clinical	Dr. McGuire	823-2216	PH 322
	Psychology, Industrial	Dr. Burroughs	823-2216	PH 313
Ph.D.	Psychology, Human Factors	Dr. Gilson	823-2755	PH 311
M.A.	Applied Sociology	Dr. Cook	823-2227	HFA 402
M.S.	Statistical Computing	Dr. Schott	823-2695	CC II 226
Business Administration		Ms. Putchinski	823-2186	CEBA II 241
M.B.A.	Business Administration			
M.A.A.E.	Applied Economics			
M.S.A.	Accounting			
M.S.T.	Taxation			
Ph.D.	Business Administration			

Education	Dr. Lynn	823-3382	ED 328
M.Ed. & M.A.	Elementary, Secondary and K-12		
M.Ed.	Instructional Technology: Educational Media		
M.A.	Instructional Technology: Instructional Systems		
M.S.	School Psychology		
Ed.S.	Specialist degrees in Educational Leadership or Curriculum/Instruction		
Ed.D.	Doctoral degrees in Educational Leadership or Curriculum/Instruction		

Engineering	Dr. Gunnerson	823-2455	CEBA 1 281
M.S.E. and M.S. degrees	in Computer Engineering, Electrical Engineering, Industrial Engineering, and Mechanical Engineering		
M.S.E., M.S. and M.C.E. degrees	in Civil Engineering		
M.S.E. and M.S. degrees	in Environmental Engineering		
M.S.E. and M.S. degrees	in Manufacturing		
Ph.D.	Civil Engineering		
Ph.D.	Computer Engineering		
Ph.D.	Electrical Engineering		
Ph.D.	Environmental Sciences		
Ph.D.	Industrial Engineering		
Ph.D.	Mechanical Engineering		

Health and Public Affairs

M.A.	Communicative Disorders	Dr. Hedrick	823-2354	HPB 118
M.S.	Health Sciences	Dr. Mendenhall	823-2406	HPB 214
M.S.	Molecular Biology & Microbiology	Dr. Gennaro	823-5932	BIO 331
M.P.A.	Public Administration	Dr. Colby	823-5365	PH 102

UNIVERSITY GRADUATE REGULATIONS

The following are minimum University-wide standards for the operation of graduate programs. Additional requirements for each graduate program are described in the individual program description (e.g., see English, Psychology, etc.).

MASTER'S PROGRAMS

STUDENT'S RESPONSIBILITY

It is the student's responsibility to keep informed of all rules, regulations, and procedures required for graduate studies. Graduate program regulations will not be waived or exceptions granted because a student pleads ignorance of the regulations or claims failure of the advisor to keep him or her informed.

EXCEPTION TO GRADUATE REGULATIONS

When unusual situations arise, petitions for exceptions to graduate regulations must be approved by the appropriate college dean prior to submission to the Dean of Graduate Studies. The Graduate Council will make recommendations to the Provost on all petitions, which will be reviewed on an individual basis.

MASTER'S COMMITTEE OR ADVISOR

Appointment of Committee or Advisor

It is the responsibility of the appropriate academic dean of the college or the coordinator of the program granting the degree to (1) determine whether an advisory committee or an advisor will be used; (2) make the necessary appointments; and (3) inform the Provost accordingly. The Provost reserves the right to place a representative on any advisory committee or to appoint a co-advisor.

Advisory Committee

A student seeking a degree requiring a thesis or one permitting considerable flexibility in course work, or a combination of the two, shall have an advisory committee of at least three members with designation of a chair and/or thesis director being optional. This committee shall recommend to the Dean of the college the design of the student's program; provide continual guidance for the student; and be the principal mechanism for the evaluation of the student's thesis and performance in any general examinations.

PROGRAM OF STUDY

A total program of study is in essence a contract between the student and the degree program specifying all degree requirements. It must be established prior to enrollment in the second term of the full-time graduate student. For a graduate student carrying a reduced load, the establishment of a program of study may be delayed up to the registration for the ninth graduate semester hour. A copy of the Program of Study must be completed for a student and sent to the Office of the Dean within the first 10 hours of graduate work.

UCF EMPLOYMENT

Normally the employment of full-time graduate students will be limited to a half-time work load (20 hours/week).

COURSE REQUIREMENTS

Course Loads

Normally, a full-time graduate student must take at least 6 hours per semester, with 12 semester hours being the maximum load. However, in order to meet residency requirements, doctoral students must register for 9 hours in two contiguous terms.

During the terms a student is employed as a teaching assistant or registered for special courses such as thesis, dissertation research, or dissertation writing, the hours may vary. Full-time for doctoral students during the summer in these cases would be 3 hours, and half-time would be one hour.

Students applying for assistance under Public Law 89-358 (Veterans Readjustment Benefits Act of 1966) must check with the Veterans Certification Office. A graduate student must register for 6 semester hours to qualify for full-time status veterans benefits. A post-baccalaureate student who anticipates graduate status must check with the Veterans Certification Office for up-to-date information. (Also see VETERANS BENEFITS and OFFICE OF VETERANS AFFAIRS.)

Total Hours Required

A minimum of 30 semester hours (combined course work and thesis) is required.

Thesis Degrees

At least 24 semester credits of course work must be earned exclusive of thesis.

Non-Thesis Degrees

At least 50 percent of the credits offered for the degree must be in a single field of concentration. *A research report is required for this degree.*

Enrollment Requirement

Master's level students who are engaged in thesis or research report related activity must be enrolled for at least 1 credit hour each semester during which this activity takes place. This requirement does not negate the requirement that **all** graduate students be enrolled the term they graduate. (See "Registration in Term of Graduation".)

Language Requirements

Foreign language requirements shall be at the option of the individual departments or appropriate units consistent with their college regulations.

Directed Independent Studies Courses

A maximum of three courses may be taken as independent study, for a total of no more than 6 semester hours.

APPLICABLE CREDITS AND COURSES

Residence Credit

At least 21 semester credits must be UCF credits. Residence credits may be earned through enrollment in courses physically offered on the main campus; or at the UCF area campuses (Cocoa, Daytona Beach, South Orlando); or at geographical locations where UCF courses are being taught by regular UCF faculty members.

Credit By Examination

Examination credit may be utilized to satisfy program course requirements, but not credit hour requirements.

Transfer of Credit

Work taken before a student is given graduate status at UCF may be transferred into the student's program of study. Transfer course work may come from the following areas:

- a. Work taken as a post-baccalaureate student at UCF.
- b. Work taken at institutions within the State University System (SUS).
- c. Work taken at other institutions not in the SUS.
- d. Work taken while in graduate status in another major while at UCF.

There is no maximum of hours on transfer work taken while in graduate status in another major at UCF except for what the program will allow. No more than 9 semester hours of graduate credit may be transferred into the graduate program from UCF post-baccalaureate work or SUS work. Work taken at other institutions has a maximum limit of 6 semester hours. However, any combination of the above transfer hours (except UCF graduate work) cannot exceed 9 hours.

Institutions not in the State University System must be fully accredited by a regional accrediting association of the Commission on Accreditation (e.g., the Southern Association of Colleges and Schools).

In all instances, only grades of B or better can be transferred.

Correspondence courses are not acceptable toward a graduate program of study; however, extension or continuing education courses may be accepted.

Recency of Credit

Credit for courses completed more than seven years prior to the term in which a degree is earned may not be used toward degree requirements in all colleges except Engineering, which requires a college waiver for work over five years old.

EXAMINATIONS

Evaluation

All examination procedures and other evaluation of a student's progress shall be the province of the individual department or appropriate unit operating within the framework of the college (or colleges for interdisciplinary programs).

Comprehensive Examination

An end-of-program comprehensive (final) examination, oral or written, is required of all students. This examination may consist of a thesis defense or an examination of course work material, or both, at the option of the department.

COURSE LEVELS OF GRADUATE WORK

6000-Level Courses. A minimum of one-half of the credit hours--including thesis hours--of an individual's program of study must be in 6000-level courses, which are designed exclusively for graduate students. Exceptions to this requirement must be approved by the Graduate Council. Exception to this rule has been granted to the Computer Science, Mathematics, and Statistics programs.

Undergraduate registration in 6000-level courses is allowed only with prior approval, utilizing the GS-7 form. Students must be within nine hours of graduation, have a 3.0 GPA, and not register for more than a total of twelve hours.

5000-Level Courses. Courses at the 5000 level may be utilized toward satisfying the graduate degree requirements.

Other. Under special circumstances 4000-level courses may be applied toward a master's degree, but not in excess of 6 semester hours. Courses at the 3000 level or below shall not be utilized in a graduate program of study unless permission is obtained from the Graduate Council prior to enrollment in the course.

ACADEMIC STANDARDS

GPA in Program of Study

A graduate student's GPA shall be calculated on only those courses specified on the individual's Program of Study filed with the Office of the Dean (not including required prerequisites).

A minimum of a 3.0 GPA in the specified graduate program of study is required to maintain graduate student status and for graduation.

In any term where the GPA drops below 3.0 in a program of study, a student will be changed to ACADEMIC PROVISIONAL status for a maximum of 9 semester hours. If the student has not attained an overall graduate GPA of 3.0 in the program of study at the end of the 9 semester hours, he will be reverted to POST-BACCALAUREATE status. (Students admitted on PROVISIONAL status are similarly given 9 semester hours to attain a 3.0 GPA.)

No graduate level courses with a grade of "D" are acceptable in a program of study. In addition, no 4000-level courses with a grade of "C" or lower are acceptable in the program of study.

Graduate students whose overall GPA falls below 2.0 will be reverted to post-baccalaureate status.

Thesis and Research Report Grades

For thesis and research report courses, satisfactory (S) or unsatisfactory (U) grade designations are used as temporary grades while the work is in progress.

Upon completion of thesis or research reports, a standard grade (A, B, C, etc.) will be awarded.

Maximum Hours of Unsatisfactory Grades

Unsatisfactory grades for graduate students consist of grades below "B" and unresolved "I" grades. A student may earn a maximum total of 6 semester hours of unsatisfactory grades in the program of study. This does not imply that a course in which a student has received these grades cannot be repeated to provide a better grade. Both grades will be used in computing the GPA in the program of study. There is no forgiveness policy on graduate grades. Exceeding 6 semester hours of unsatisfactory grades in a specified graduate program of study is reason for immediate removal from graduate status.

Incomplete Grade

A grade "I" (incomplete) is assigned by the instructor when a student is unable to complete a course due to extenuating circumstances, and when all requirements can clearly be completed in a short time following the close of regular classes. The Registrar's Office must be notified of the appropriate grade to be assigned no later than the date shown in the academic calendar of the term immediately following that in which the "I" was assigned. Failure to complete course requirements by that day may, at the discretion of the instructor, result in the assignment of an "F" grade. It is the student's responsibility to arrange with the instructor for the changing of the "I" grade to receive credit. Both the new grade and the letter "I" will appear on the student's permanent record. If the "I" grade is not changed by the established deadline, it becomes a part of the student's permanent record and no credit is given for the class. A student may register for a course in which an "I" was received, but no repeat "R" action will be made on the permanent record.

Review of Performance

The primary responsibility for monitoring performance standards rests with the degree program. However, the Office of the Dean may monitor a student's progress and may revert any student to post-baccalaureate status if performance standards as specified above are not maintained.

A degree program may revert any graduate student to post-baccalaureate status at any time when, in its judgment, the individual is deemed incapable of successfully performing at required standards of excellence.

If a student is reverted to post-baccalaureate status, reinstatement to graduate student status can occur only through a successful petition to the Graduate Council by the student.

DEGREE APPLICATION PROCESS

Application for Degree

An Intent to Graduate form must be filed in the University Records Office by the end of the first week of the term of graduation. If the student does not graduate in that term, a new form must be filed at the beginning of the term of anticipated graduation. An extension can be obtained by telephoning the Records Office to have the old form updated if graduation is to be the following term.

Certification for Degree

The college of the degree program must certify through the Office of the Dean that all University and program of study requirements have been met.

Registration in Term of Graduation

A student must be registered in any term in which UCF *faculty or administrative and professional time will be required (e.g., review of thesis or research report by faculty or editorial staff, or for examinations, etc.)*. Therefore, unless the graduate program certifies to the Office of the Registrar that no UCF resources will be utilized, a student *must* be registered in the term of graduation.

DOCTORAL PROGRAMS

UNIVERSITY ADMISSIONS STANDARDS

Admission to graduate status generally requires a minimum of a 3.0 GPA in the last 60 semester hours of undergraduate studies, or a score of at least 1000 on the combined verbal-quantitative portion of the appropriate admissions examination (GRE or GMAT), or a master's degree from an accredited institution and GRE scores. Admission to graduate

status does not constitute admission to a doctoral program. Meeting minimum University admission standards for graduate status may not satisfy doctoral program admission requirements. Additional or higher criteria may be required.

EXAMINATIONS

To avoid confusion of terminology for examinations, all programs should use the following terms:

Qualifying Examination. This title is used for the examination (optional by programs) which the student takes prior to being admitted to Doctoral (or Specialist) status.

Candidacy Examination. This title is used for the examination which the student takes prior to admission to Candidacy Status. This is a written examination and is permanently filed in the student's permanent records.

Dissertation Proposal Examination. After passing the general Candidacy Examinations, the student will write and defend a Dissertation Proposal in an oral examination.

Dissertation Defense. This is an oral examination (or defense) on the dissertation.

DOCTORAL STATUS

Eligibility for admission to a doctoral program should be limited to superior students who have demonstrated intellectual ability, high achievement, and adequate preparation for advanced study and research in a chosen field. The decision to accept the student in a doctoral program is made by the graduate committee of the program area concerned and the Dean of the college on the basis of qualifying examinations and/or other criteria as specified by the individual program area.

PROGRAM OF STUDY

A program of study (i.e., required course work) will be specified by the student's program area and approved by the Dean of the college.

COURSE REQUIREMENTS

The course requirements for a doctoral degree will consist of lectures, seminars, discussions, and independent study. Each program of study will include a minimum of 72 semester hours of graduate credit beyond the baccalaureate degree, 57 semester hours of which must be exclusive of the dissertation, with at least 6 semester hours of course work outside the student's program area and no more than 12 semester hours of independent study (including independent study hours counted towards a master's degree). The particular plan of study, which may vary from student to student, should be formulated jointly by the student and the appropriate committee or advisor in the program area.

ACADEMIC STANDARDS

Academic standards which apply to master's students will not be lower for doctoral and specialist students.

SPECIAL DEGREE REQUIREMENTS

Each student may be expected to demonstrate an appropriate competency in a related area. The appropriate competency must be carefully defined by the program area and approved by the student's committee and the Dean of the college. Any course credit earned in attaining such a skill does not count toward minimum hours requirements.

RESIDENCY REQUIREMENTS

Each student is expected to complete two contiguous semesters in full-time graduate student status after acceptance into a doctoral program. Doctoral students must be registered a minimum of 9 semester hours during this time.

TRANSFER CREDIT

The number of transfer credit hours to be applied to the minimum course requirement for a doctoral degree at UCF will be up to 30 semester hours of credit and will be determined on a case-by-case basis by the graduate committee of the program area at the time the student is admitted to the program. The transfer hours from the master's degree or post-master's work will consist of a maximum of six hours of 4000-level work, no 3000-level courses, and no courses with grades of less than "B."

TIME LIMITATION

The student has seven years from the date of admission to the doctoral program to complete the dissertation. If a student passes the seven-year deadline, the candidacy examinations must be repeated.

CANDIDACY

Admission to Candidacy

Admission to candidacy will occur after the student has satisfied all general degree requirements, has passed the general Candidacy Examinations, and has successfully defended the Dissertation Proposal.

Candidacy Examinations. Candidacy examinations are mandatory for admission to candidacy and are to be held at the completion of the student's course work and prior to the dissertation stage. These examinations must be written and should be based on the student's plan of study. In the examination the student is expected to demonstrate substantial mastery of the general knowledge of the field, including theory, bibliography and research methodology. These written examinations shall be administered and supervised on campus, and will be set up by the program area in coordination with the Office of the Dean. All written original examination materials will be kept in the student's permanent file.

Dissertation Proposal Examination. After passing the general candidacy examinations, the student must develop a written dissertation proposal which will be defended by the student in an oral examination conducted by the dissertation committee.

Status as Candidate

Enrollment. The student must continue to enroll for at least one semester hour of research or dissertation credit each semester after attaining candidacy status until the oral defense of the dissertation has been made. Post-candidacy enrollment is allowable for a maximum of four (4) years subject to the seven (7) year time limitation.

NOTE: The post-candidacy enrollment requirement of at least one semester hour, while generally satisfactory to encourage reasonable progress towards the degree for students not in residence, shall be interpreted as requiring enrollment in at least three semester hours of research or dissertation credit each semester by those students who are in residence at UCF and placing substantial time demands on their major professors.

Dissertation Committee Composition. A committee, which will consist of a minimum of four faculty members (three from the college in which the program is located and one from outside that college), must be approved by the Dean of the college and the Provost. Program areas may specify in greater detail the distribution of the three in-college members. All members should be in fields related to the dissertation topic. All members vote on acceptance or rejection of the dissertation. The dissertation must be approved by a majority of the committee.

Dissertation. Dissertations are required in all doctoral programs. An oral defense of the dissertation is required with copies of the approved dissertation being prepared in accordance with program requirements and sent to University Microfilms International (UMI). The final unbound dissertation will be submitted in triplicate to the Office of the Dean before the specified deadline. The designated original of the dissertation and one copy will be sent to the Library for hardbinding. The third copy (also unbound) of the dissertation will be forwarded to UMI.

The student will pay a binding fee for the two Library copies. If the candidate wishes to have the third copy bound after it is returned from UMI, a third binding fee must be paid. There is also a fee for microfilming the dissertation.

Dissertation Defense. The Dean of Graduate Studies or his designee will attend all dissertation defenses.

Certification for Degree

Doctoral candidates who have completed all the requirements for the degree and have successfully completed the dissertation may request certification to that effect prior to the receipt of the degree. Such certification will be issued by the Dean of the college with approval of the Provost.

PUBLIC ACCESS

Students, faculty, staff, and other interested parties are strongly encouraged to attend thesis and dissertation final defense sessions. Notices providing date, time, and location of such meetings must be distributed to all academic departments. Faculty advisors and students should consult the *Handbook for Doctoral Dissertations* and *Instructions for Preparing Theses* for deadlines. These sessions are educational and informative for graduate students and provide an opportunity for colleagues to observe the work of their peers with students. At the discretion of the Chair of the Committee, questions may be invited from the audience. That part of the session involving committee discussion leading to a vote on the acceptance of the work will be closed. Sessions may be recessed briefly to excuse visitors and candidate before this stage begins.

Consequently, the first step in the process of developing a research proposal is to identify a topic of interest. This is often done by reviewing the literature in the field and identifying areas where there is a need for further research. Once a topic has been identified, the next step is to develop a research question or hypothesis. This is often done by reviewing the literature and identifying gaps in the knowledge. The final step is to develop a research plan, which includes a description of the methods to be used, the data to be collected, and the analysis to be performed.

Public Affairs

Public Affairs is a field of study that deals with the relationship between the government and the public. It is a multidisciplinary field that draws on a variety of disciplines, including political science, sociology, and communication. Public Affairs is concerned with the ways in which the government interacts with the public, and the ways in which the public can influence the government. This includes the study of public opinion, public participation, and public policy. Public Affairs is a field of study that is constantly evolving, as the relationship between the government and the public changes over time.

STUDENT SERVICES

HOUSING OFFICE

Enrolled single students paying registration fees for a minimum of nine semester hours may apply for assignment to University residential units. Priority of assignment is given first to current residents and second to new students admitted in good standing. Any single student applicant who has been admitted to the University may submit an application requesting housing and food service for a specific term. Priority of room assignments is based on the date of receipt of the completed application in the Housing Office. Applicants should carefully read the application before submitting it with the \$25 pre-payment to the Housing Office.

INTERNATIONAL STUDENT SERVICES

The International Student Office serves as a clearing-house for international student affairs, and as a focal point for international student concerns. The office aids international students by offering assistance in locating off-campus apartments and banking. Counseling on personal, financial, academic, and cross-cultural communication matters is available. Liaison is maintained with the Immigration and Naturalization Service. Further information may be obtained from the International Student Office, Administration Building, Room 225.

STUDENT HEALTH SERVICE

The Student Health Service is maintained on an outpatient basis for routine and emergency health needs and to promote health education. The service is staffed by doctors and registered nurses when classes are in session. Medical care in the students' living quarters is not provided. Every student who pays the health fee is entitled to the benefits outlined in the Health Service brochure.

Blood is available when needed for students, staff, faculty, and their immediate families through the Student Health Service.

Medical records are confidential communications and will be treated as such insofar as the law permits.

MINORITY STUDENT SERVICES

The Office of Minority Student Services is responsible for coordinating special programs, projects, and special services for minority students. The office cooperates with Student Services in the recruitment, admission, and retention of minority students, and is responsible for monitoring and facilitating the academic progress of minority students. Minority Student Services also assists in arranging cultural and social programs to enhance the development of the individual.

UNIVERSITY COUNSELING AND TESTING CENTER

The University Counseling and Testing Center offers a professional staff of counselors to aid students in selecting vocational-educational objectives, overcoming learning difficulties, solving problems of personal-social adjustment, and dealing with marital or other problems. A full range of tests is available along with the use of an occupational library. All aspects of counseling and testing are confidential.

STUDENT ACTIVITIES

Personal development may, in part, be enhanced through informed, experienced, dedicated participation in the University and community. The University sponsors a variety of cultural and entertainment programs which will contribute to the student's social, cultural, recreational, and academic development. Additionally, opportunity is provided to become a member of occupational, professional, social, and honorary organizations.

STUDENT GOVERNMENT

The purpose of the Student Government at the University is to represent student opinion; advance the cause of students both socially and academically; promote communication, cooperation and understanding among students; and to insure that Student Government shall continue to be used as a democratic instrument of change. Additionally, Student Government is authorized to determine the allocation of the activity and service fee.

There are many services available to students through their Student Government, including discount movie and dinner theater tickets, babysitting referral, consumer affairs, carpool, legal aid, and dental aid.

STUDENT CENTER/STUDENT UNION

The Student Center and Student Union give students opportunities for social and cultural activities. These facilities, with their many programs, services, and gathering places, serve students, faculty, staff, University patrons, alumni, and guests. These facilities are funded by activity and service fees.

The Student Center contains food service facilities, an auditorium, conference and meeting rooms, art gallery, game room, arts and crafts center, and lounge areas.

The new Student Union contains the University bookstore, food service facilities, and lounge/meeting rooms.

OFFICE OF AREA CAMPUS SERVICES

The Office of Area Campus Services, as the official liaison for Student Affairs and student services, maintains contact and communication with the directors of the campuses in Brevard, Daytona Beach, and South Orlando. The office insures that student services are provided and that communication between the main campus and the area campuses is maintained.

OFFICE OF EVENING STUDENT SERVICES

The Evening Student Services Office, which is located in Room 282 in the Administration Building, is open from 5:00 p.m. to 9:00 p.m., Monday through Thursday evenings. If problems cannot be resolved there, they are referred to the appropriate office.

HANDICAPPED STUDENT SERVICES

The Office of Handicapped Student Services provides information and orientation to campus facilities and services, assistance with handicapped parking permits, counseling, referral to campus services, and assistance with registration for students who are handicapped.

Services are available to students whose disabilities include, but are not limited to, mobility, visual or hearing impairment; manual dexterity or speech impairment; specific learning disability (such as dyslexia); epilepsy; diabetes; or mental or psychological disorder.

Students who have a disability or handicap are requested to contact the office. All information is confidential and will be used only to assist the student.

CREATIVE SCHOOL FOR CHILDREN

The Creative School for Children provides an educational program, including kindergarten, for children 2 through 5 years old. The daily program is planned and executed by Florida certified teachers. The children receive a wide variety of experiences in art, music, language, motor skills, science, math, social studies, perceptual development, socialization, and self-discovery. Planned and spontaneous field trips and special family programs are a part of the yearly schedule. The school conducts a Summer Day Camp for elementary school children during the summer term.

CLASSROOM RESPONSIBILITY

Students are responsible for maintaining classroom decorum appropriate to the educational environment. When the conduct of a student or group of students varies from acceptable standards to such an extent that normal classroom procedures are interfered with, the instructor has the authority to remove the offending party from the room.

STUDENT CONDUCT

Students are subject to federal and state laws and local ordinances as well as regulations prescribed by the University and the Florida Board of Regents. The breach or violation of any of these laws or regulations may result in disciplinary action.

When a student is involved in an offense resulting in criminal charges prior to admission, the circumstances of the case may be reviewed by the appropriate Student Affairs committee to consider the student's eligibility for admission to the University as well as participation in extracurricular activities.

ACADEMIC ETHICS POLICY

The faculty members of the University of Central Florida are committed to a policy of honesty in academic affairs. Conduct for which students may be subject to administrative and/or disciplinary penalties up to and including suspension or expulsion include:

Dishonesty consisting of cheating of any kind with respect to examination, course requirements, or illegal possession of examination papers. Any student helping another to cheat is as guilty as the student assisted.

Plagiarism consisting of the deliberate use and appropriation of another's work without any indication of the source and the passing off of such work as the student's own. Any student who fails to give credit for ideas or materials taken from another is guilty of plagiarism.

In cases of cheating or plagiarism, the instructor shall take whatever academic action is deemed appropriate. This may range from loss of credit for a specific assignment, examination, or project, to removal from the course with a grade of "F." The instructor should seek to resolve the problem with the student to their mutual satisfaction. In addition, the instructor may also request disciplinary action through the Dean of Students if necessary, who shall proceed in accordance with provisions outlined in the APA Chapter 6C7-5.041.

CONFIDENTIALITY OF STUDENT RECORDS

The University policy which governs confidentiality and access to student records is provided in the student handbook, *The Golden Rule*. The policy explains in detail the procedures to be used by the institution for compliance with the Family Educational Rights and Privacy Act of 1974 as amended. Copies of the policy may be obtained from the Office of Student Affairs. This office also maintains a directory of records which lists all educational records maintained on students by the University.

OFFICE OF VETERANS AFFAIRS

The Office of Veterans Affairs is for students who are utilizing veterans benefits to further their education. The office has a professional staff augmented by student veterans to assist in providing information concerning entitlements, filing claims to the Veterans Administration, and certifying enrollment at the University. Counseling for personal and academic problems is provided as well as referral to various agencies in the community. Veterans must be certified through this office to receive VA educational benefits. Veterans' academic progress is monitored on a continuous basis.

All veterans and dependents are urged to contact the office at an early stage in the process of applying for admission.

VETERANS BENEFITS

Veteran-students eligible to receive VA educational benefits must make initial contact with the Veterans Certification Office.

Those students with an undergraduate degree who are classified as post-baccalaureate must carry at least twelve (12) semester hours for full VA benefits, nine (9) semester hours for three-fourths, and six (6) semester hours for one-half. Five (5) semester hours or less will be reimbursed to the veteran at cost of instruction only. Veterans and eligible dependents who are pursuing course work while in a post-baccalaureate status can only receive benefits for courses which will be accepted for transfer into a graduate program when they are given graduate status (normally 9 semester hours). Post-baccalaureate students pursuing teachers' certification, CPA examination or other special non-degree programs will receive benefits for all courses required by their program of study.

Those accepted in a graduate degree-seeking program are required to carry six (6)

semester hours for full benefits, four (4) to five (5) for three-fourths, and three (3) semester hours for one-half.

Veterans intending to enroll in a dual program with the option of receiving VA benefits must contact the Veterans Affairs Office.

Those on co-op status may choose to draw VA benefits for their period of eligibility either under the institutional or the cooperative program.

RECREATIONAL SERVICES

Recreational Services offers a variety of sports and recreational opportunities to students, faculty, and staff at the University. Included in the program are intramural sports leagues and tournaments, coed sports, organized recreation/fitness opportunities, unstructured open recreation and competitive sports clubs. For the fitness minded, there are physical fitness classes, a Rec-Milers Club and ample equipment which may be checked out and used on the University recreational facilities. A handbook which provides full information, rules, and regulations on all activities is available from the Office of Recreational Services.

INSTRUCTIONAL RESOURCES

Director: Robert L. Arnold, LR 107, Phone 823-2571

Associate Director: David W. Retherford

The primary purpose of Instructional Resources is to improve instruction. To meet both the academic and administrative needs of the University, Instructional Resources provides the faculty with graphic, photographic, radio and television production; a full range of audiovisual and classroom support services; and a wide range of instructional development assistance and consultation. Instructional Resources also administers the Center for Faculty Support, the University Learning Center, the Listening Lab, Cable TV-Channel 35, Brevard Educational Cable Network, and WUCF-FM.

UNIVERSITY BOOKSTORE

The University Bookstore carries required textbooks, supplemental books, and associated supplies for all UCF courses. In addition, a complete line of school and art supplies, sundries, paperbacks, gifts, and other items of interest is available. A customer service desk provides for special orders such as class rings. During the last three days of each semester, the bookstore has a "buy-back" period for used text books. Student I.D. cards must be presented as identification when selling books.

UCF AREA CAMPUSES

The University of Central Florida offers a number of upper-division and graduate-level courses at three area locations in Central Florida. Contact the area campus for information as to the current courses and program offerings.

UCF BREVARD CAMPUS

1519 Clearlake Road
Cocoa, Florida 32922
(407) 632-4127

UCF DAYTONA BEACH CAMPUS

1200 Volusia Avenue
PO Box 2811
Daytona Beach, FL 32120-2811
(904) 255-7423

UCF SOUTH ORLANDO CAMPUS

7300 Lake Ellenor Drive
Orlando, Florida 32809
(407) 855-0881

PROGRAM AND COURSE DESCRIPTIONS

The remainder of the catalog lists the graduate programs now available at the University of Central Florida. These are arranged first by College, and then by the individual program. Within each program there is a listing of the faculty, a description of the program, the requirements necessary for graduation, and a list of the courses available.

A number of general statements about the course numbering system should make the descriptions more understandable.

CLASSIFICATION OF COURSES

3000-4999 are junior- and senior-level courses and are designed primarily for advanced undergraduate students. Selected 4000-4999 courses may serve the needs of the individual graduate students if approved for inclusion in an individual program of graduate study by a supervisory committee approved by the Dean of the college.

5000-5999 are beginning graduate-level courses.

6000-6999 are courses open only to graduate students.

7000 are doctoral-level courses.

FLORIDA STATEWIDE COURSE NUMBERING SYSTEM

The course numbers appearing in the catalog are part of a statewide system of prefixes and numbers developed for use by all public post-secondary and participating private institutions in Florida. One of the major purposes of this system is to make transferring to another institution easier by identifying courses which are equivalent, no matter where they are taught in the state. All courses designated as equivalent will carry the same prefix and last three digits.

The classifying and numbering of courses was done by community college and university faculty members in each academic discipline. Their work was reviewed by faculty members in all of Florida's post-secondary institutions who made suggestions and criticisms to be incorporated into the system.

The course numbering system is, by law, descriptive and not prescriptive. It in no way limits or controls what courses may be offered or how they are taught. It does not affect course titles or descriptions at individual schools. It seeks only to describe what is being offered in post-secondary education in Florida in a manner that is intelligible and useful to students, faculty and other interested users of the system.

It should be noted that a receiving institution is not precluded from using nonequivalent courses for satisfying certain requirements.

GENERAL RULE FOR COURSE EQUIVALENCIES

All undergraduate courses bearing the same alpha prefix and last three numbers (and alpha suffix, if present) have been agreed upon to be equivalent. For example, an introductory course in sociology is offered in over 40 post-secondary institutions in Florida. Since these courses are considered to be equivalent, each one will carry the designator SOC--0000.

FIRST DIGIT

The first digit of the course number is assigned by the institution, generally to indicate the year it is offered--i.e., 1 indicates freshman year, 2 indicates sophomore year. In the sociology example mentioned above, one school which offers the course in the freshman year will number it SOC 1000; a school offering the same course in the sophomore year will number it SOC 2000. The variance in the first number does not affect the equivalency. If the prefix and last three digits are the same, the courses are substantially equivalent.

TITLES

Each institution will retain its own title for each of its courses. The sociology courses mentioned above are titled at different schools "Introductory Sociology," "General Sociology," and "Principles of Sociology." The title does not affect the equivalency. The courses all carry the same prefix and last three digits; that is what identifies them as equivalent.

LAB INDICATORS

Some courses will carry an alpha suffix indicating a lab. The alpha suffixes "L" and "C" are used as follows to indicate laboratories:

"L" means either (a) a course, the content of which is entirely laboratory or (b) the laboratory component of a lecture-lab sequence at a different time/place from the lecture course.

"C" means a combined lecture-lab course in which the lab is offered in conjunction with the lecture at the same time and place.

Examples: PSY 6318 (lecture only)

ENV 6017L (lab only)

PCB 6235C (lecture & lab combined)

SPECIAL COURSES

In addition to the regular courses listed in this catalog, special courses may be available. Consult an academic advisor for details.

In order to register for any of the special numbers below, a student must present an authorization form (GS-10) obtained from the Department.

	SPECIAL GRAD	GRAD & PROF
Directed Independent Studies	5907	6908
Directed Research	5917	6918
Special Topics/Seminars	5937	6938
*Internships, Practicums, Clinical Practice	5944	6946
Study Abroad	5957	6958
*Research Report		6909
*Treatise (Thesis or Research Report)		6971
*Thesis—Specialist		6973
*Doctoral Research		7919
*Doctoral Special Topics/Seminars		7939
*Doctoral Dissertation		7980

*For Graduate Status students only.

*These courses may be assigned variable credit. Some may be repeated upon approval.

ABBREVIATIONS IN COURSE DESCRIPTIONS

PR denotes a PREREQUISITE course which must be earned prior to enrollment in the listed course.

CR denotes a COREQUISITE course which must be taken concurrently with or prior to the listed course.

C.I. denotes that registration is contingent upon the CONSENT OF THE INSTRUCTOR.

HOURS CODE

Each course listed is followed by a code which shows hours of credit and contact hours.

Example: ECI 5215C Hydraulic Engineering

3 cr (2,3)

ECI 5215C carries 3 hours of credit, but requires 5 contact hours which consist of 2 hours in class and 3 hours laboratory or field work.

COLLEGE OF ARTS AND SCIENCES

The College of Arts and Sciences consists of seventeen academic departments, twelve of which offer graduate degrees: Biology, Chemistry, Communication, Computer Science, English, History, Mathematics, Physics, Political Science, Psychology, Sociology and Anthropology, and Statistics. The specific programs for the various degrees are listed below.

COLLEGE ADMINISTRATION

<i>E. P. Sheridan</i>	Dean
<i>K. L. Seidel</i>	Associate Dean
<i>B. A. Whisler</i>	Assistant Dean

Doctor of Philosophy

Computer Science
Physics
Psychology (Human Factors)

Master of Arts

Communication
English
History
Political Science
Sociology, Applied

Master of Science

Biology
Chemistry, Industrial
Computer Science
Mathematical Science
Physics
Psychology (Clinical and Industrial/Organizational
Programs are offered)
Statistical Computing

GENERAL REQUIREMENTS

The course work and research requirements of the programs are designed with the intent of offering students the opportunity for educational advancement and professional training. A research report, thesis, or dissertation is required in most of the programs and is offered as an option in others.

The General Graduate Record Examination is required for graduate status in all programs even if a student is acceptable on the basis of a grade point average.

Each department is headed by a chair who reports to the dean of the college. A graduate program coordinator is designated for each program and is the key contact on questions of admission and degree requirements. Consult the individual degree program listings for descriptions of requirements and courses offered by each program.

ART

Jagdish J. Chavda Acting Chair
Office: FA 523B, Phone (407) 823-2676

Art Courses

ARH 5451 Artistic Worldviews 3 cr (3,0)

PR: Post-bac status, nine hours of art courses or C.I. Art from individual and cultural perspectives of varying ethnic, religious, occupational, regional, and generational groups.

ARH 5478 Contemporary Women Artists 3 cr (3,0)

PR: Six credits of art courses or C.I. An indepth study on contemporary women artists from a feminist perspective.

BIOLOGY

D. T. Kuhn Graduate Program Coordinator
Office: BIO 110, Phone (407) 823-2976

Biology Faculty

<i>L. M. Ehrhart, Ph.D.</i>	Professor
<i>L. L. Ellis, Ph.D.</i>	Emeritus Professor
<i>J. L. Koevenig, Ph.D.</i>	Professor
<i>D. T. Kuhn*, Ph.D.</i>	Professor
<i>H. A. Miller*, Ph.D.</i>	Professor
<i>J. A. Osborne, Ph.D.</i>	Professor
<i>F. F. Snelson, Jr., Ph.D.</i>	Professor
<i>I. J. Stout*, Ph.D.</i>	Professor
<i>H. C. Sweet, Ph.D.</i>	Professor
<i>W. K. Taylor*, Ph.D.</i>	Professor
<i>H. O. Whittier*, Ph.D.</i>	Professor
<i>D. H. Vickers, Ph.D.</i>	Chair and Associate Professor

*Hold graduate faculty status at USF.

Admission

The Graduate Record Examination (GRE) is required of all graduate students. Minimal requirements for consideration for graduate status in any of the M.S. programs in Biology are a grade point average (GPA) of at least 3.0 for the last 60 semester hours of undergraduate study or a score of at least 1000 on the combined quantitative-verbal sections of the GRE. In addition, the department requires three letters of recommendation and a written statement of past experience and research, area of interest, and immediate and long-range goals. Personal interviews are helpful but not required. The department requires international students and students whose native language is not English to have a minimum TOEFL score of 550.

Applicants who fail to meet either the minimum program GPA or GRE requirement may occasionally be accepted if there is other convincing evidence of potential for high achievement and success. Applicants failing to satisfy minimum program criteria should submit a GRE Subject (Advanced) Biology Test score at or above the 50th percentile. In no case will GRE scores (verbal, quantitative, or advanced) older than five years be accepted.

Applicants need not have an undergraduate degree in a biological science but are expected to have the equivalent of 16 semester hours credit in the biological sciences, including at least 3 credit hours each in botany, and zoology; plus organic chemistry with laboratory; and basic college mathematics and statistics. After acceptance, minor deficiencies can be remedied by enrollment at the first opportunity in an appropriate course. Students receiving teaching or research assistantships are expected to maintain a minimum of 6 semester hours of approved graduate credit every term of departmental support.

Examinations

A comprehensive examination is required of all students in the program. The comprehensive exam must be taken no later than the semester preceding that of thesis defense. If a

student fails the comprehensive examination, a minimum of four weeks must elapse before re-examination. The comprehensive exam may be taken a maximum of two times. In addition, an oral thesis defense is required in the thesis option. A minimum of four weeks must elapse between the comprehensive and thesis defense examinations.

Programs in Biology

The Master of Science degree in Biology is offered with the following areas of specialization: biology, botany, limnology, and zoology. There are two options available: (1) a thesis option which includes a minimum of 30 semester hours of courses; and (2) a non-thesis option which includes a minimum of 40 semester hours of courses.

A cooperative Ph.D. degree is offered between Biology at UCF and Biology at USF (University of South Florida). See USF graduate catalog for details. This program requires 90 semester hours beyond the baccalaureate. A student in this program takes course-work at both UCF and USF, conducts dissertation research at UCF, and is required to establish one year of USF residency. Language certification will be accomplished at UCF and proficiency in computer language established at either location. The Ph.D. degree will be granted at USF.

**Master of Science Degree Requirements—
Biology**

THESIS OPTION

A student selecting the biology thesis option will take the following courses:

Group A (three of the six courses)		12-14 Semester Hours
PCB 5046C	Advanced Ecology	5 hours
PCB 5675C	Evolutionary Biology	4 hours
	or	
BOT 5705C	Plant Biosystematics	4 hours
PCB 6585C	Advanced Genetics	5 hours
PCB 6581	Comparative Animal Physiology	3 hours
	or	
PCB 6365	Environmental Physiology	3 hours
Group B (both courses)		8 Semester Hours
BSC 6938	Biology Seminar	2 hours
BSC 6971	Thesis	6 hours

Group C

Restricted electives acceptable to the student's graduate committee.

Total Minimum Semester Hours Required: 30



NON-THESIS OPTION

A student selecting the biology non-thesis option will take the following courses:

Group A (three of the six courses)		12-14 Semester Hours
PCB 5046C	Advanced Ecology	5 hours
PCB 5675C	Evolutionary Biology	4 hours
	or	
BOT 5705C	Plant Biosystematics	4 hours
PCB 6585C	Advanced Genetics	5 hours
PCB 6581	Comparative Animal Physiology	3 hours
	or	
PCB 6365	Environmental Physiology	3 hours
Group B (both courses)		4 Semester Hours
BSC 6909	Research Report	2 hours
BSC 6938	Biology Seminar	2 hours
Group C		22-24 Semester Hours
Restricted electives acceptable to the student's graduate advisor.		
Total Minimum Semester Hours Required:		40

DOCTOR OF PHILOSOPHY DEGREE REQUIREMENTS—BIOLOGY

A student selecting the Cooperative Ph.D. dissertation option will complete the M. S. thesis option, or its equivalent.

thesis option, or its equivalent.	
Group A (M.S. thesis courses, or equivalent)	30 hours
Group B (USF residency, 10 structured hours plus 8 unstructured, in a single academic year, 9 hours/semester)	18 hours
Group C (Dissertation minimum)	16 hours
Group D (Special Topics, Seminars, other courses taken in consultation with Advisor)	26 hours
Total Minimum Semester Hours Required:	
	90

Biology Courses

BOT 5495C Bryology 3 cr (2,3)
PR: BOT 4303C or C.I. A lecture-laboratory survey course on the diversity and classification of mosses, liverworts and hornworts with special emphasis on those found in Florida.

BOT 5705C Plant Biosystematics 4 cr (3,2)
PR: Graduate standing or C.I. Evolutionary processes among plant taxa and populations utilizing cytology, morphology, biochemistry, breeding systems, and co-evolution.

BOT 6146C Terrestrial Vegetation 4 cr (2,6)
PR: 8 hours in biological sciences or science teaching experience or C.I. Classification and identification among terrestrial plant groups and their natural association in the field. Major reference sources reviewed.

BSC 6950 Biological Research Resources 3 cr (3,0)
PR: Graduate Status. Research methodology including literature resources, problem conceptualization, research proposals, data collection, and analysis and presentation of findings.

PCB 5044 Ecosystems of Florida 5 cr (3,2)
PR: PCB 3043, PCB 3043L or equivalent. Ecosystems of Florida will be discussed to include geography, geology, climate, energetics, nutrient cycling, community structure and conservation.

PCB 5045C Conservation Biology 4 cr (3,2)
PR: PCB 3043 and PCB 3063. Scientific basis of conservation; conservation of ecosystems, populations, exploited species, and endangered species. Weekend field trips are required.

PCB 5046C Advanced Ecology 5 cr (3,4)
PR: Ecology, statistics and 2 years of biological science. Population and community ecology with emphasis on growth, regulation, species interactions, succession, and community classification.

PCB 5675C Evolutionary Biology 4 cr (3,2)
PR: PCB 3043 and PCB 3063 or C.I. Review of concepts in evolutionary biology. Emphasis on evolution at and below the species level; consideration of genetics and ecological factors in divergence and speciation.

PCB 6049 Contemporary Studies in Biology **2 cr (2,0)**
 PR: Graduate standing. Analysis of current publications and developments in theory and concepts of biological sciences. May be repeated for credit as content is variable.

PCB 6365 Environmental Physiology **3 cr (3,0)**
 PR: Physiology and ecology or C.I. The effects of major environmental factors on the physiology of plants and animals.

PCB 6581 Comparative Animal Physiology **3 cr (3,0)**
 PR: PCB 3023 or PCB 4723 or C.I. Comparison of structural and functional adaptations of animal organ systems. Emphasis upon maximization of fitness under given environmental conditions.

PCB 6585C Advanced Genetics **5 cr (3,6)**
 PR: PCB 3063 or C.I. Recent advances in genetics, stressing molecular and developmental trends.

ZOO 5456C Ichthyology **4 cr (2,6)**
 PR: ZOO 3303C or C.I. Introduction to the biology of the fishes, their classification, evolution and life histories.

ZOO 5463C Herpetology **4 cr (2,6)**
 PR: 6 hours of zoology or C.I. Introduction to the biology of the amphibians and reptiles, their classification, evolution and life histories.

ZOO 5475C Ornithology **4 cr (2,6)**
 PR: 6 hours of zoology or C.I. Introduction to the biology of birds, their classification, evolution, and life histories.

ZOO 5483C Mammalogy **4 cr (2,6)**
 PR: 6 hours of zoology or C.I. Introduction to the biology of mammals, their classification, evolution and life histories.

ZOO 5815 Zoogeography **3 cr (3,0)**
 PR: 8 hours of zoology or C.I. Principles and concepts concerning regional patterns of animal distributions of the world, both past and present.

BSC 6909 Research Report **2 cr**

BSC 6971 Thesis **1-6 cr**

CHEMISTRY, INDUSTRIAL

Seth Elsheimer Graduate Program Coordinator
 Office: CH 332, Phone (407) 823-2246

<i>C. A. Clausen, Ph.D.</i>	Professor
<i>G. N. Cunningham, Ph.D.</i>	Professor
<i>J. T. Gupton, Ph.D.</i>	Professor
<i>G. R. Hertel, Ph.D.</i>	Professor
<i>F. E. Juge, Ph.D.</i>	Associate Vice President and Professor
<i>B. C. Madsen, Ph.D.</i>	Professor
<i>G. Mattson, Ph.D.</i>	Professor
<i>W. W. McGee, Ph.D.</i>	Professor
<i>D.H. Miles, Ph.D.</i>	Chair and Professor
<i>L. M. Trefonas, Ph.D.</i>	Associate Vice President for Academic Affairs, Dean of Graduate Studies and Professor
<i>S. R. Elsheimer, Ph.D.</i>	Associate Professor
<i>M. D. Hampton, Ph.D.</i>	Associate Professor
<i>M. P. McCann</i>	Assistant Professor

Admission

The Graduate Record Examination (GRE) is required of all graduate students. Minimal requirements for admission include a grade point average (GPA) of 3.0 for the last 60 semester hours of undergraduate study or a score of at least 1000 on the combined quantitative-verbal sections of the General (Aptitude) test of the GRE. In addition, the departmental evaluation relies on letters of recommendation. Proficiency examinations may

be required. Results may be used to aid in planning the student's program of study. Deficiencies may require remedial course work.

Program in Industrial Chemistry

The Master of Science degree at the University of Central Florida is aimed particularly at preparing students for careers in the chemical industry, or in related fields which utilize chemical processing techniques. The curriculum is designed to provide a broad overall perspective of the industry and an awareness of economic and engineering considerations while placing the primary emphasis upon chemistry and the application of chemical principles to the development of products and processes.

Master of Science Degree Requirements— Industrial Chemistry

REQUIRED CORE COURSES

12 Semester Hours

CHM 6430	Chemical Thermodynamics	2 hours
CHM 6440	Kinetics and Catalysis	2 hours
CHM 6710	Applied Analytical Chemistry	2 hours
CHM 6938	Seminar	2 hours
CHS 6251	Applied Organic Synthesis	2 hours
CHS 6260	Chemical Unit Operations and Separations	2 hours

ELECTIVES

12 Semester Hours

At least nine (9) of the total twelve (12) credits must be taken from the following list (All elective courses must be approved by the student's advisory committee.):

CHM 5235	Applied Molecular Spectroscopy	3 hours
CHM 5450	Polymer Chemistry	3 hours
CHM 5451	Polymer Chemistry Lab	2 hours
CHM 5711	The Chemistry of Materials	2 hours
CHS 5262	Industrial Chemical Processes	2 hours
CHS 5305	Applied Biological Chemistry	3 hours
CHS 6261	Chemical Process and Product Development	2 hours

THESIS

6 hours

EXAMINATION REQUIREMENTS

Satisfactory completion of a final examination is required.

Total Minimum Semester Hours Required:

30

Chemistry Courses

CHM 5235 Applied Molecular Spectroscopy

3 cr (3,0)

PR: CHM 3120C and CHM 3211. Determination of chemical structure through interpretation of UV, IR, NMR and Mass Spectra.

CHM 5450 Polymer Chemistry

3 cr (3,0)

PR: CHM 3211. An introduction to the chemistry of synthetic polymers. Synthetic methods, polymerization mechanisms, characterization techniques and polymer properties will be considered.

CHM 5451 Polymer Chemistry Laboratory

2 cr (0,6)

PR: CHM 3211 and CHM 3410. A laboratory course designed to introduce students to the major polymerization mechanisms. Polymers synthesized in the laboratory will be characterized using modern instrumental methods.

CHM 5580 Advanced Physical Chemistry

3 cr (3,0)

CR: CHM 3411 and PR: MAC 3313. Selected topics of thermodynamics, kinetics, quantum mechanics, and structure.

CHM 5711 The Chemistry of Materials

2 cr (2,0)

PR: CHM 3211, CHM 4130C, and CHM 3411. Structure and properties of chemical products with an emphasis on the correlation between molecular form and the functional properties deemed desirable for the product.

CHM 6430 Chemical Thermodynamics

2 cr (2,0)

PR: CHM 3411 or equivalent. Classical and statistical thermodynamics with emphasis on industrial applications and estimation methods.

CHM 6440 Kinetics and Catalysis

2 cr (2,0)

PR: CHM 3411 or equivalent. Classical kinetics with an emphasis on industrial applications and current catalysis methodologies.

CHM 6710 Applied Analytical Chemistry

2 cr (2,0)

PR: CHM 3211, CHM 4130C, and CHM 3411 or equivalent. Concepts in molecular structure that integrate structural, physical, and chemical properties with aspects of industrial and analytical chemistry.

CHS 5262 Industrial Chemical Processes

2 cr (2,0)

PR: CHM 3211 and 3411. Familiarization with basic considerations of large-scale inorganic and organic chemical manufacturing techniques, raw materials, and the petrochemical industry.

CHS 5305 Applied Biological Chemistry

3 cr (3,0)

PR: CHM 3211. The identification from plants, synthesis, assessment of bioactivity, and design of pharmaceuticals and agrochemicals, as well as the impact of biotechnology in the chemical industry.

CHS 6251 Applied Organic Synthesis

2 cr (2,0)

PR: CHM 3211, and CHM 3411. A survey of chemical syntheses from both a product-oriented standpoint and a process-oriented standpoint. Relevant examples from the pharmaceutical and agricultural chemical industries.

CHS 6260 Chemical Unit Operations and Separations

2 cr (2,0)

PR: C.I. A study of the elements and dynamics that are fundamental to industrial separation methods and transport processes.

CHS 6261 Chemical Process and Product Development

2 cr (2,0)

PR: C.I. Development of chemical products and processes including the determination of technical and economic feasibility; use of experiment design in the optimization of variables and scale-up methods.

CHM 6938 Seminar

2 hours

CHM 6971 Thesis

1-6 hours

COMMUNICATION

B. Pryor Graduate Program Coordinator
Office: HFA 528A, Phone (407) 823-5670 or 823-2681

<i>R. L. Arnold, Ph.D.</i>	Professor
<i>R. H. Davis, Ph.D.</i>	Professor
<i>F. E. Fedler, Ph.D.</i>	Professor
<i>C. H. Harpole, Ph.D.</i>	Professor
<i>J. G. Hoglin, Ph.D.</i>	Professor
<i>M. D. Meeske, Ph.D.</i>	Professor
<i>M. T. O'Keefe, Ph.D.</i>	Professor
<i>B. Pryor, Ph.D.</i>	Professor
<i>K. P. Taylor, Ph.D.</i>	Professor
<i>D. Weider-Hatfield</i>	Professor
<i>J. W. Welke, Ph.D.</i>	Chair and Professor
<i>J. F. Butler, Ph.D.</i>	Associate Professor
<i>W. K. Grasty, Ph.D.</i>	Associate Professor
<i>J. Maunez-Cuadra, Ph.D.</i>	Associate Professor
<i>G. K. McCann</i>	Associate Professor
<i>R. F. Smith</i>	Associate Professor
<i>E. B. Wycoff, Ph.D.</i>	Associate Professor
<i>S. Andersen</i>	Assistant Professor
<i>W. J. Hall</i>	Assistant Professor
<i>P. Jeffery</i>	Assistant Professor
<i>F. L. Johnson</i>	Assistant Professor

Admission

The Graduate Record Examination is required of all graduate students. Minimal requirements for admission are a grade point average (GPA) of 3.0 for the last 60 semester hours of undergraduate study and a minimum score of at least 1000 on the verbal-quantitative sections of the General (Aptitude) test of the GRE. Admission is restricted to fall semester only.

Programs in Communication

The following curriculum emphasizes communication research. The courses prepare students for research positions, some teaching positions, and entry to most Ph.D. programs in the field.

Master of Arts Degree Requirements— Communication

Students are required to complete 34 semester hours of work, including a thesis. Students must complete a basic core of courses in theory and methodology, and must successfully pass the program's comprehensive examination.

The curriculum for the master's degree includes the following courses:

REQUIRED COURSES		21 Semester Hours
EDF 6401	Statistics for Educational Data or STA 4163, Statistical Methods II or STA 5206, Statistical Analysis	3 hours
SPC 6219	Modern Com. Theory	3 hours
SPC 5200	Evolution of Com. Theory or COM 6121, Communication Management or SPC 6938, Communication Conflict	3 hours

COM 6303	Communication Research I	3 hours
COM 6304	Communication Research II	3 hours
MMC 6603	Communication and Society	3 hours
SPC 6442	Small Group Communication	3 hours

ELECTIVES 9 Semester Hours

THESIS 4 Semester Hours

Total Minimum Semester Hours Required: 34

Communication Courses

COM 6121 Communication Management 3 cr (3,0)
Analysis and development with reference to particular media. Organizational theory, structure and behavior. Management principles and operations.

COM 6303 Communication Research I 3 cr (3,0)
Analysis of theory and methodology in communication research, with emphasis on persuasion, nonverbal communication, and interpersonal communication.

COM 6304 Communication Research II 3 cr (3,0)
PR: Statistics and COM 6303. Planning and implementation of research in persuasion, nonverbal communication, and interpersonal communication.

MMC 6445 Mass Media Research I 3 cr (3,0)
An introduction to mass communication theories and to both applied and theoretical research in mass communication.

MMC 6446 Mass Media Research II 3 cr (3,0)
PR: Statistics and MMC 6445. Planning and implementation of mass media research.

MMC 6603 Communication and Society 3 cr (3,0)
The importance of the mass media, their structure, role, and problems.

MMC 6611 Effects of Advertising on Society 3 cr (3,0)
An in-depth study of advertising's effects on consumer behavior, societal mores and media economics.

MMC 6612 Communication and Government 3 cr (3,0)
A study of the relationship between the media and government.

SPC 5200 Evolution of Communication Theory 3 cr (3,0)
General Survey - major communication trends from classical era to the present. Comparison of Aristotelian and non-Aristotelian rhetorics. Contributions of principal figures will be discussed.

SPC 6219 Modern Communication Theory 3 cr (3,0)
Comparative analysis of theories and models of human communication, behavior systems, encoding and decoding processes, interaction variables, and social context.

SPC 6442 Small Group Communication 3 cr (3,0)
A study of communication and its effect on small group behavior.

COM 6908 Independent Study 1 - 3 cr

COM 6918 Research 1 - 3 cr

COM 6971 Thesis 4 cr (4,0)

COMPUTER SCIENCE

Ronald D. Dutton Graduate Program Coordinator
Office: CC II 206, Phone (407) 275-2341

R. C. Brigham, Ph.D. Professor
N. Deo, Ph.D. Millican Endowed Chair in Computer Science and Professor

<i>R. D. Dutton, Ph.D.</i>	Associate Chair and Professor
<i>T. J. Frederick, Ph.D.</i>	Chair and Professor
<i>C. E. Hughes, Ph.D.</i>	Professor
<i>A. Mukherjee, Ph.D.</i>	Professor
<i>M. A. Bassiouni, Ph.D.</i>	Associate Professor
<i>L. K. Cottrell, Ph.D.</i>	Associate Professor
<i>J. R. Driscoll, Ph.D.</i>	Associate Professor
<i>H. C. Gerber, Ph.D.</i>	Associate Professor
<i>F. Gomez, Ph.D.</i>	Associate Professor
<i>R. K. Guha, Ph.D.</i>	Associate Professor
<i>S. D. Lang, Ph.D.</i>	Associate Professor
<i>J. Leeson, Ph.D.</i>	Associate Professor
<i>J. M. Moshell, Ph.D.</i>	Associate Professor
<i>A. Orooji, Ph.D.</i>	Associate Professor
<i>D. A. Workman, Ph.D.</i>	Associate Professor
<i>N. Chandrasekharan, Ph.D.</i>	Assistant Professor
<i>K. Hua</i>	Assistant Professor
<i>M. Shah, Ph.D.</i>	Assistant Professor
<i>N. R. Vempaty</i>	Assistant Professor
<i>U. Vemulapati</i>	Assistant Professor

Admission

Admission is based on satisfying the regular University requirements and department requirements. The minimum University requirements consist of the following:

- a. A baccalaureate degree from an accredited institution and an earned grade point average (GPA) of at least 3.0 in the last two years of undergraduate work or a combined score of 1000 or more on the quantitative-verbal sections of the General (Aptitude) Test of the Graduate Record Examination (GRE)
OR
- b. A previous graduate degree from an accredited institution.

The minimum department requirements are the following:

- a. Each student is required to submit a score on the Subject (Advanced) GRE in Computer Science that is not more than two years old at the time of admission to regular graduate status.
- b. An undergraduate degree in computer science is desirable, but not required. Applicants without a strong undergraduate background in computer science will be required to demonstrate an understanding of the material covered in the following courses:

CDA 4150	Introduction to Computer Architecture
COP 4710	Databases
COT 4500	Numerical Calculus
COP 4020	Programming Languages I
COP 4600	Programming Systems
COT 4210	Discrete Computational Structures

The student may choose to demonstrate the knowledge of these courses by scoring well on the Subject (Advanced) GRE in Computer Science. It is estimated that more than 85% of this GRE deals directly with the material covered in these courses.

- c. International students must obtain a minimum score of 550 on the TOEFL exam.

Admission to Ph.D. Program

Admission to the Ph.D. program in Computer Science is formalized by the University upon the recommendation of the Computer Science Graduate Committee. In addition to satisfying the regular University requirements, the department requires that the applicant pass the Ph.D. Qualifying Examination and find a qualified faculty member in Computer Science willing to chair the student's advisory committee. Any transfer credits toward requirements for the Ph.D. program must be approved by the University and the depart-

ment. Normally, these credits must correspond to equivalent requirements and performance levels expected for the program.

*NOTE: Meeting minimum University admission standards for graduate status may not satisfy doctoral program admission requirements. Additional or higher criteria may be required.

Programs in Computer Science

The Department of Computer Science offers a Master of Science and a Doctor of Philosophy degree in Computer Science. Students receive a broad background in the areas of programming systems and languages, computer architecture, and computer science theory before specializing in a research area.

Research interests of the faculty include computer architecture, VLSI systems, parallel processing, design and study of algorithms, graph theory, microprocessors, programming languages, operating systems, natural language processing, computer vision, machine learning, data base management systems, computer graphics, interactive graphic systems of instruction, distributed processing/networking and computational complexity.

The department houses the Center for Parallel Computation, directed by Dr. N. Deo, containing a BBN Butterfly 16 processor machine.

Master of Science Degree Requirements— Computer Science

REQUIRED COURSES

9 Semester Hours

(Students must receive an A or B grade in these courses.)

a. CDA 5106	Advanced Computer Architecture I	3 hours
b. COT 5400	Design and Analysis of Algorithms	3 hours
c. COP 5611	Operating Systems Design Principles	
	or	
COP 5021	Programming Languages II	
	or	
COT 5310	Formal Languages and Automata Theory	3 hours

RESTRICTED ELECTIVES

Restricted electives must include two 6000-level Computer Science courses taught by the Department of Computer Science. These two 6000-level courses are exclusive of independent study and may not include any courses for which the grade received is below a B. Additional credits will normally be taken from 5000- and 6000-level Computer Science courses. Approval may be granted for at most six credits to be taken from graduate courses outside Computer Science.

Three options are available. The Research Survey option is a 36 hour program allowing at most 6 hours of independent study and requires that the student write a comprehensive literature survey paper, while enrolled in 3 hours of Research 6918, on a current topic of interest in Computer Science. The Research Project and Research Thesis options are both 30 hour programs exclusive of independent study. The research project normally entails the implementation and description of a substantial piece of software, while the thesis requires the analysis and description of a much more theoretical endeavor. These tasks are intended to span two semesters, and students are to enroll in 3 credits of 6918 research each semester.

Regardless of the electives or option chosen, the plan of the student must satisfy the following:

- The plan of study must contain 30-36 semester hours depending upon the option selected.
- Grades received in these hours must be letter grades of A, B, or C with no more than 6 hours of C work and a grade point average of 3.0 or better.
- The plan of study can contain no courses below the 5000-level.

- d. The plan of study can contain no more than 6 hours (or two courses) of independent study in the Research Survey option and none in the other options.
- e. No course may be applied toward the degree which was completed more than 7 years prior to the date of graduation.
- f. Each student must also complete a research survey (exactly 3 credits), a research project or thesis (exactly 6 credits). The student must enroll for at least one hour of 6918 in the semester graduation is to occur.

SAMPLE PLANS OF STUDY

Student's plan of study can be designed to emphasize any of a number of areas within Computer Science. The following are some sample plans of study. They do not include all areas of emphasis nor are they fixed, but they are included here to show the flexibility of the Master of Science program.

VLSI Emphasis (Survey Option)

REQUIRED		9 Semester Hours
CDA 5106	Advanced Computer Architecture I	3 hours
COT 5400	Design & Analysis of Algorithms	3 hours
COP 5611	Operating Systems Design Principles	3 hours

ELECTIVES (6 hours at 6000-level)		24 Semester Hours
CDA 5210	Architecture and Design of VLSI	3 hours
CDA 5212	VLSI Design Tools	3 hours
CDA 5213	VLSI Testing and System Integration	3 hours
CDA 6211	VLSI Algorithms and Architecture	3 hours
CDA 6107	Advanced Computer Architecture II	3 hours
Other		9 hours

RESEARCH		3 Semester Hours
CDA 6918	Research	3 hours

Artificial Intelligence Emphasis (Survey Option)

REQUIRED		9 Semester Hours
CDA 5106	Advanced Computer Architecture I	3 hours
COT 5400	Design and Analysis of Algorithms	3 hours
COP 5021	Programming Languages II	3 hours

ELECTIVES		24 Semester Hours
CAP 5410	Computer Vision	3 hours
CAP 5601	Advanced Artificial Intelligence	3 hours
CAP 5610	Machine Learning	3 hours
CAP 6640	Computer Understanding of Natural Language	3 hours
CAP 6671	Intelligent Systems	3 hours
COT 5310	Formal Languages and Automata Theory	3 hours
CAP 6411	Computer Vision Systems	3 hours
OTHER		3 hours

RESEARCH		3 Semester Hours
CAP 6918	Research	3 hours

Software Tools Emphasis (Project Option)

REQUIRED		9 Semester Hours
CDA 5106	Advanced Computer Architecture I	3 hours
COT 6410	Computational Complexity	3 hours
COP 5021	Programming Languages II	3 hours

ELECTIVES		15 Semester Hours
COT 5400	Design and Analysis of Algorithms	3 hours
COT 6300	The Theory of Parsing and Translation	3 hours

COP 6621	Compiler Construction	3 hours
CIS 5610	Software Engineering	3 hours
COP 5570	Software Tools	3 hours

RESEARCH		6 Semester Hours
COP 6918	Research	6 hours

Parallel Computation Emphasis (Project Option)

REQUIRED		18 Semester Hours
CDA 5106	Advanced Computer Architecture I	3 hours
COT 5400	Design and Analysis of Algorithms	3 hours
CDA 5110	Parallel Architecture and Algorithms	3 hours
COT 6410	Computational Complexity	3 hours
COT 6415	Complexity of Parallel Computation	3 hours
COT 5310	Formal Languages and Automata Theory	3 Hours

ELECTIVES		6 Semester Hours
CDA 6107	Advanced Computer Architecture II	3 hours
CDA 6520	Computer Networks Design and Distributive Processing	3 hours

RESEARCH		6 Semester Hours
CDA 6918	Research	6 hours

Doctor of Philosophy Degree Requirements— Computer Science

PH.D. QUALIFYING EXAMINATION

The Qualifying Examination is taken only when the student has obtained regular graduate status in Computer Science. The purpose of this examination is to determine the student's knowledge in important areas of computer science—architecture, languages, and theory—and to assess the student's potential to pursue an area of specialization and research.

The Ph.D. Qualifying Examination will be administered in two phases:

Phase I (Written Exam)

Phase I of the Qualifying Examination consists of a written examination in the following three areas:

1. Architecture: CDA 5106 Advanced Computer Architecture
2. Languages: COT 5310 Formal Languages and Automata Theory
3. Theory: COT 5400 Design and Analysis of Algorithms

This phase will be offered twice per year in September and January, and each student will be allowed at most two attempts, in two consecutive offerings, to pass this phase.

Phase II (Committee Exam)

Upon successful completion of Phase I, the student must identify an area of study for his Ph.D. research and an advisory committee chaired by a Computer Science graduate faculty member. A tentative plan of study approved by the student's advisory committee should be filed. The advisory committee will then examine the student to ascertain the student's ability to conduct independent research. This examination will be a narrowly focused examination in and around the area of the student's specialty. The format and length of the examination will be determined by the student's committee (e.g., may be oral and/or written and may involve surveying literature and submitting critical reviews of selected research articles). Each student will be allowed at most two attempts to pass

Phase II. However, the student is expected to pass Phase II within no more than one year from passing Phase I.

Upon successful completion of the Qualifying Examination, the student will be admitted to the Ph.D. program.

PLAN OF STUDY

The plan of study will consist of a minimum of seventy-two (72) semester hours of graduate credit, including a minimum of twenty-four (24) semester hours of advanced (6000-level) graduate courses with a special emphasis on the doctoral area of specialization and an adequate treatment of other major areas of computer science and related disciplines. The plan must include six (6) hours of graduate work outside of computer science and eighteen (18) hours of additional 5000- or 6000-level approved graduate courses containing at least nine (9) semester hours of courses exclusive of independent study taught by the Computer Science department.

The plan of study must include a minimum of fifteen (15) semester hours of Ph.D. research credits.

RESEARCH COMMITTEE

The formation of a research committee should occur as soon as the student has identified a potential research area. This committee will consist of no more than five faculty members, three of whom must be Computer Science graduate faculty and at least one of whom must be from outside the College of Arts and Sciences.

CANDIDACY EXAMINATION

The Candidacy Examination will consist of two parts: (1) a four-hour written examination in the specialty area as defined by the plan of study, to be designed by the chair in consultation with the members of the research committee, and (2) a presentation of a written doctoral research prospectus to the committee with an oral review of the proposal.

RESIDENCE REQUIREMENT

Students in the Ph.D. program are normally expected to be full-time students. Students must spend at least two consecutive semesters as a full-time student at UCF (that is, registered for a minimum of nine hours each of the two terms). At least one of the semesters used for the residency requirement must occur while the student holds candidacy status.

TIME LIMITATION

The student has seven years from the beginning of regular graduate status in the Ph.D. program to complete all requirements for the Ph.D. degree.

SPECIAL DEGREE REQUIREMENTS

Each student is expected to demonstrate competency in an area relevant to his research. This must be carefully defined by the student's committee and approved by the Computer Science Graduate Committee and Office of the Dean.

DISSERTATION AND ORAL DEFENSE

Each student must write a dissertation on his research which describes a significant original contribution to the field of computer science. The oral defense of the dissertation is administered by the research committee which makes a critical inquiry into the work reported in the dissertation and into the areas of knowledge that are immediately relevant to the research. All members vote on acceptance or rejection of the dissertation. The dissertation must be approved by a majority of the committee. Upon approval, the final dissertation must be deposited in the department and in triplicate to the Office of the Dean before the final deadline of the term in which the student plans to graduate.

Computer Science Courses

CAP 5410 Computer Vision

3 cr (3,0)

PR: COP 3530. Image formation, binary vision, region growing and edge detection, shape representation, dynamic scene analysis, texture, stereo and range images, and knowledge representation.

CAP 5600 Artificial Intelligence and Prolog

3 cr (3,0)

PR: CAP 4630. Analysis of deductive databases, applications of logic programming to knowledge representation and "expert systems."

CAP 5601 Advanced Artificial Intelligence

3 cr (3,0)

PR: CAP 4630. AI theory of knowledge representation, "expert systems," memory organization, problem solving, learning, planning, vision and natural language.

CAP 5610 Machine Learning

3 cr (3,0)

PR: CAP 4630 or C.I. Origin/evaluation of machine intelligence; machine learning concepts and their applications in problem solving, planning and expert systems; symbolic role of humans and computers.

CAP 5725 Computer Graphics Systems I

3 cr (3,0)

PR: COP 3530. Architecture of graphics processors; display hardware; principles of programming and display software; problems and applications of graphic systems.

CAP 6411 Computer Vision Systems

3 cr (3,0)

PR: CAP 5410. Perceptual organization, geometric reasoning, knowledge and model representations, interpretations; Acronym, Visions, Consight, 3PPO, ANGY, ALVEN.

CAP 6412 Advanced Computer Vision

3 cr (3,0)

PR: CAP 5410. Computational theories of perception, shape from 'X' techniques, multi-resolution image analysis, 3-D model based vision, perceptual organization, spatio-temporal model, knowledge based vision systems.

CAP 6640 Computer Understanding of Natural Language

3 cr (3,0)

PR: CAP 5601. A study of the different approaches to build programs to "understand" natural language. The theory of parsing, knowledge representation, memory and inference will be studied.

CAP 6671 Intelligent Systems

3 cr (3,0)

PR: CAP 5610. Study of computer systems exhibiting intelligent attributes, particularly learning; basic concepts related to characteristics, capabilities, design and principles of operation; discussion of relevant philosophical/social issues.

CAP 6701 Computer Graphic Systems II

3 cr (3,0)

PR: CAP 5725. Modeling design and analysis of graphics systems; data structures, numerical techniques, algorithms and optimum seeking methods for various problems in computer graphics.

CDA 5106 Advanced Computer Architecture I

3 cr (3,0)

PR: CDA 4150. Evolution of computer architecture; memory organization; cache; virtual memory; high speed processor design; pipeline multi-functional and array machines; special architecture case studies; overview of channel architecture.

CDA 5110 Parallel Architecture & Algorithms

3 cr (3,0)

PR: COT 4210, CDA 5106. General-purpose vs. special-purpose parallel computers; arrays; message-passing; shared-memory; taxonomy; parallelization techniques; communication, synchronization and granularity; parallel data structures; automatic program restructuring.

CDA 5210 Architecture and Design of VLSI

3 cr (3,0)

PR: CDA 4150 or equivalent. Overview of VLSI technology. Logical design of basic subsystems; integrated system design tools; design of a VLSI computer system.

CDA 5212 VLSI Design Tools

3 cr (3,0)

PR: CDA 5210, a strong programming background and C.I. VLSI implementation systems; layout languages; tools; graphic tools; sticks compactor; design rule checking algorithms; simulation models; tools; routing algorithms; silicon compilers; knowledge-based VLSI tools.

- CDA 5213 VLSI Testing and System Integration** 3 cr (3,0)
PR: CDA 5210. Test vectors; fault models; design for testability; LSSD; languages for testing; performance measurements; interrupts; bus concepts and standards; testing and systems integration.
- CDA 6107 Advanced Computer Architecture II** 3 cr (3,0)
PR: CDA 5106. Multiprocessor systems; interconnection network; stack architectures; high-level language architecture; design languages; performance evaluation.
- CDA 6108 Selected Topics in Computer Architecture** 3 cr (3,0)
PR: CDA 5106. Selected research papers on multiprocessors, data base machines, virtual machines, ultracomputer, connection machine, MPP, Butterfly flow architectures, object-based architectures, fault-tolerant architectures.
- CDA 6211 VLSI Algorithms and Architecture** 3 cr (3,0)
PR: CDA 5210. VLSI algorithms, algorithms on regular geometries, hierarchically organized machines; illustrative algorithms: Matrix, DFT, recurrence evaluation, pattern matching, searching, sorting, graph, etc.; area-time complexity issues.
- CDA 6501 Computer Communications Networks Architecture** 3 cr (3,0)
PR: CDA 5106. Introduction to networking; architecture of circuit, message and packet switching networks; local computer networks architecture; modems, protocols.
- CDA 6520 Computer Networks Design and Distributive Processing** 3 cr (3,0)
PR: CDA 6501 and COP 5611. Computer communications networks design considerations, network operating system, distributive processing.
- CGS 5310 Computer Based Educational Systems** 3 cr (3,0)
PR: COP 4020 or equivalent. The design and implementation of computer based educational systems. Selected projects using high-level programming languages.
- CIS 5101 Computational Techniques in Management Information Systems** 3 cr (3,0)
PR: CIS 4710. The role of computers in management information systems; analysis, design approaches, processing methods and data management; use of state-of-the-art software in design and development.
- CIS 5610 Software Engineering** 3 cr (3,0)
PR: COP 4020. Knowledge of ADA. Study of design techniques for large software systems, modularization, task assignment, management techniques, implementation techniques, testing, quality control, documentation and maintenance.
- COP 5021 Programming Languages II** 3 cr (3,0)
PR: COP 4020 and COT 4210. Introduction to compiler construction, parsing, parser generators, attributed grammars and the implementation of block structures and recursion. Students write a high-level language translator.
- COP 5570 Software Tools** 3 cr (3,0)
PR: COP 4600 and COP 5021. Systems programming languages, concurrent programming, design and implementation of software development/maintenance tools. A large programming project is required.
- COP 5611 Operating Systems Design Principles** 3 cr (3,0)
PR: COP 4600. Structure and functions of operating systems, process communication techniques, high-level concurrent programming, virtual memory systems, elementary queueing theory, security, distributed systems, case studies.
- COP 5711 Principles of Data Base Systems** 3 cr (3,0)
PR: COP 4710. Physical data organizations, popular data base systems, data models, reorganization, security, recovery, concurrency, distributed data bases, data base machines.
- COP 6614 Operating Systems Techniques** 3 cr (3,0)
PR: COP 5611. Techniques in the design and implementation of operating systems. Case studies of several experimental and commercial operating systems.
- COP 6615 Operating Systems Theory** 3 cr (3,0)
PR: COP 5611. Scheduling and queueing theory, simulation, and performance evaluation of computer systems.
- COP 6621 Compiler Construction** 3 cr (3,0)
PR: COP 5021, COT 5310. Techniques in the design and implementation of compilers. Optimization, code generation, error recovery, attributed grammars. A project is required.

COP 6730 Data Base System Techniques	3 cr (3,0)
Recent and/or more advanced developments in data base systems (e.g., recovery protocols, concurrency control schemes, query processing techniques, user interfaces, expert data base systems.)	
COP 6731 Data Base System Theory	3 cr (3,0)
PR: COP 5711. Theoretic aspects of data bases (e.g., relational data theory, security models, data models, performance optimization.)	
COT 5310 Formal Languages and Automata Theory	3 cr (3,0)
PR: COP 4020 and COT 4210. Classes of formal grammars and their relation to automata, normal forms, closure properties, decisions problems, LR(k) grammars.	
COT 5400 Design and Analysis of Algorithms	3 cr (3,0)
PR: COT 4210 and COT 4400. Classifications of algorithms, e.g., recursive, divide-and-conquer, greedy, etc. Data structures and algorithm design and performance. Time and space complexity analysis.	
COT 6410 Computational Complexity	3 cr (3,0)
PR: COT 5400. Properties of algorithms, computational equivalence of machines, time-space complexity measures, examples of algorithms of different complexity, classification of algorithms, classes P and NP.	
COT 5501 Computational Methods/Applications	3 cr (3,0)
PR: CNM 4500. Computational solution techniques for algebraic equations, ODE and PDE models of applications selected from science, engineering, applied mathematics and computer science.	
COT 5515 Computational Methods/Linear Systems	3 cr (3,0)
PR: CNM 4500 and MAS 3113. Mathematical models for linear systems, linear programming, the simplex method, integer and mixed-integer programming, introduction to nonlinear optimization and linearization.	
COT 6300 The Theory of Parsing and Translation	3 cr (3,0)
PR: COT 5310. Methods of top-down and bottom-up parsing, LL(k), recursive descent, precedence, bounded-context, SR(s,k), SLR(k), LALR(k), LR(k), parser compression and generation.	
COT 6415 Complexity of Parallel Computation	3 cr (3,0)
PR: CDA 5110, COT 5410. Theoretical models - justification and buildability inherent parallelism and communication costs. Lower and upper complexity bounds. Parallel computation thesis. NC, SC classes; paradigms of parallel algorithms.	
COT 6505 Computational Methods/Analysis I	3 cr (3,0)
PR: COT 5515. Analysis of direct and iterative solutions of systems of linear equations, eigenvalues and vectors and roots of nonlinear equations, error analysis.	
COT 6506 Computational Methods/Analysis II	3 cr (3,0)
PR: COT 6505. Analysis of numerical methods for approximation, integration and solution of ordinary differential equations. Lagrange polynomials, splines, Gaussian quadrature, Fourier series. Stability and illconditioning. Error analysis.	
CAP, CDA, CIS, CNM, COP or COT prefixes are used for the following:	
6918 Research	3 credits
7919 Doctoral Research	
7980 Doctoral Dissertation	

ENGLISH

Beth Barnes Graduate Program Coordinator
Office: HFA 433, Phone (407) 823-2212

R. R. Adicks, Ph.D.	Professor
R. Astro, Ph.D.	Provost and Professor
S. E. Omans, Ph.D.	Professor
J. F. Schell, Ph.D.	Chair and Professor
G. J. Schiffhorst, Ph.D.	Professor
R. E. Umphrey, Ph.D.	Professor
W. Wyatt	Professor

<i>B. Barnes, Ph.D.</i>	Associate Professor
<i>J. J. Donnelly, Ph.D.</i>	Associate Professor
<i>J. Hemschemeyer</i>	Associate Professor
<i>D. R. Jones, Ph.D.</i>	Associate Professor
<i>P. J. Rushin</i>	Associate Professor
<i>K. L. Seidel, Ph.D.</i>	Associate Dean and Associate Professor
<i>M. E. Sommer, Ed.D.</i>	Associate Professor
<i>P. D. Deane, Ph.D.</i>	Assistant Professor
<i>K. Z. Keller, Ph.D.</i>	Assistant Professor
<i>D. L. Stap, Ph.D.</i>	Assistant Professor

Admission

Minimum requirements for admission are a grade point average (GPA) of 3.0 for the last 60 semester credit hours earned as an undergraduate and a total score of 1000 on the aptitude section of the Graduate Record Examination (GRE). International students must score at least 575 on the Test of English as a Foreign Language (TOEFL).

Other criteria for admission are a baccalaureate degree in English or its equivalent, at least a year's study of a foreign language, and approval by the Graduate Committee of the Department of English. Students are expected to have read widely in British and American literature, to be highly competent in writing, and to be familiar with the vocabularies of literary criticism and grammar.

A student with a baccalaureate degree in a subject other than English may qualify for Graduate status by presenting a score of at least 540 on the Advanced GRE Test in Literature or completing survey courses in British and American Literature.

Applicants are urged to apply for the program and take the GRE before April 1 for the subsequent fall term and before November 1 for the spring term.

Master of Arts Degree Requirements—

English/Literature:

Each student must complete at least 33 hours, including one course in linguistics and five core courses. Near the end of the degree program, each candidate will write a comprehensive examination based on a prescribed reading list and a) write a thesis or b) take an oral examination on a specific area of literature.

REQUIRED COURSES

		18 Semester Hours
ENG 5009	Graduate Research in English	3 hours
LIN 5137	Linguistics (or an equivalent)*	3 hours
LIT 6009	Literary Genres	3 hours
LIT 6105	World Literature	3 hours
LIT 6365	Movements in Literature	3 hours
LIT 6535	Major Authors	3 hours

*May be waived if student has completed a course in linguistics on the 4000 level or above with an A or B.

ELECTIVES

12 Hours

COMPREHENSIVE EXAMINATION

SPECIALIZATION — Choose A or B

3 hours

A. THESIS OPTION:

The candidate will complete a formal thesis on a topic selected in consultation with an advisory committee and will meet both departmental and university requirements for the thesis. The student will enroll at least once in LIT 6971, Thesis, for three hours of credit.

B. EXTENDED RESEARCH AND ORAL EXAMINATION OPTION:

The candidate will enroll in LIT 6908, Directed Independent Study, and read extensively in an area of speciality—English romantic poetry, for example. The student will then complete a formal oral examination on the area of expertise.

TOTAL MINIMUM HOURS

33 hours

English/Creative Writing:

Each student must complete at least 33 hours, including six hours of writing workshops. Near the end of the degree program, each candidate will write a comprehensive examination based on a prescribed reading list and will write a creative thesis.

REQUIRED COURSES

		12 Semester Hours
CRW 5097	Graduate Writing Workshop	3 hours
CRW 6009	Advanced Writing Workshop	3 hours
LIT 5097	Studies in Contemporary Fiction	3 hours
LIT 5039	Studies in Contemporary Poetry	3 hours

RESTRICTED ELECTIVES

		9 Semester Hours
LIT 6105	World Literature	3 hours
LIT 6009	Literary Genres	3 hours
LIT 6365	Movements in Literature	3 hours
LIT 6535	Major Authors	3 hours

OPEN ELECTIVES:

(selected with assistance of advisor) 9 Semester Hours

COMPREHENSIVE EXAMINATION

THESIS: 3 hours

The candidate will complete a book-length manuscript (fiction, poetry, or other genre) of publishable quality, written and revised in CRW 6971 Thesis (3 hours). The manuscript will be submitted for review and approval by the graduate creative writing faculty.

TOTAL MINIMUM HOURS 33 hours

English Courses

CRW 5004 Graduate Writers' Workshop 3 cr (3,0)
Student writers present their own work, receiving detailed analysis of its strengths and weaknesses from their fellow writers and from the teacher.

CRW 6009 Graduate Writing Workshop 3 cr (3,0)
PR: Admission to the Creative Writing Specialization of the English M.A. program. Writing and revising in one established form. Graduate Writing Workshop must be taken three times (for a total of 9 hours) in order to produce a book-length manuscript (fiction, poetry, or other genre). May be repeated for credit.

CRW 5932 Teaching Creative Writing 3 cr (2,1)
Creative writing practicum. May be repeated for credit.

ENG 5009 Graduate Research in English 3 cr
A study of the aims and methods of literary scholarship and research.

ENG 5018 Literary Criticism 3 cr (3,0)
Historical survey of major critics from classical antiquity to the modern era.

ENG 5028 Rhetoric and Literature 3 cr (3,0)
Investigates the development of written strategies of persuasion. Traces their relation to practical and imaginative literature. Applications to classroom teaching of literature and composition.

ENL 5226 English Renaissance Poetry and Prose 3 cr (3,0)
PR: Senior standing or C.I. The course will examine selected poetry and prose of Wyatt, Surrey, Sidney, Spenser, Marlowe, Raleigh, Daniel, Shakespeare, Chapman, Lyly, and others.

ENL 5335 Studies in Shakespeare 3 cr (3,0)
Representative plays with emphasis on Shakespeare's development as an artist: aesthetics of dramatic literature.

ENL 5347 The Age of Milton 3 cr (3,0)
Emphasis on the non-dramatic works of John Milton. Selections from the non-dramatic works of other 17th Century figures.

- ENL 5356 Eighteenth Century Studies** 3 cr (3,0)
Reading, analysis and discussion of literature in English: 1660-1880.
- LAE 5367 English Composition and Literature for Teachers of Advanced Placement** 3 cr (3,0)
PR: Graduate standing and C.I. A two-week summer institute for secondary school teachers preparing to teach Advanced Placement courses.
- LAE 5372 Theory and Practice in Composition** 3 cr (2,1)
PR: Senior standing or C.I. Intensive study of theories of composition, with practical experience in the writing laboratory and in composition classes.
- LAE 6375 Practicum: The Teaching of Composition** 3 cr (3,0)
Close work with an experienced instructor in teaching an undergraduate composition course, combined with regular group meetings for discussion of problems of teaching composition.
- LIN 5137 Linguistics** 3 cr (3,0)
Modern linguistic theories and studies focusing on language acquisition and development, contemporary American English, semantics, and paralinguistics.
- LIN 5805 Language and Meaning** 3 cr (3,0)
An examination of how language conveys meaning and the implications about the nature and structure of the mind.
- LIN 6932 Problems in Linguistics** 3 cr (3,0)
PR: LIN 5137. Study of the application of linguistics to various aspects of teaching and communication.
- LIT 5039 Studies in Contemporary Poetry** 3 cr (3,0)
English language poetry from 1945 to the present. Emphasis will be on American poets, but others such as English or Australian will be included.
- LIT 5097 Studies in Contemporary Fiction** 3 cr (3,0)
Fiction in the last 20 years in the United States and Britain. May be repeated for credit.
- LIT 5309 Media and Popular Literature** 3 cr (3,0)
PR: Senior standing or C.I. Study of the literary content of contemporary media and of popular fiction. Application to classroom teaching.
- LIT 5366 The Romantic Revolt (19th Century Literature)** 3 cr (3,0)
The romantic revolt in poetry and prose; English, American, and Continental literature, 1798-1832.
- LIT 5367 The Victorian Age** 3 cr (3,0)
PR: Senior standing or C.I. Study of poets and essayists from 1837 to 1900, including Tennyson, the Brownings, Arnold, Hopkins, Carlyle, and Mill; emphasizing Dickens, George Eliot, the Brontës, and Hardy and other novelists.
- LIT 6009 Literary Genres** 3 cr (3,0)
PR: Graduate standing. Provenance, structure and critical problems in a specific genre such as tragedy, the epic, the novel, or the lyric. May be repeated for credit when content is different.
- LIT 6105 World Literature** 3 cr (3,0)
PR: Graduate standing. Study of the influence on British and American literature of selected foreign works read in translation. May be repeated for credit when content is different.
- LIT 6365 Movements in Literature** 3 cr (3,0)
PR: Graduate standing. Study of a movement such as naturalism, romanticism, or classicism, or of a literary period such as the Baroque or the Southern Renaissance. May be repeated for credit when content is different.
- LIT 6535 Major Authors** 3 cr (3,0)
PR: Graduate standing. Study of a single author or of two or three associated authors, with emphasis on biography, bibliography, and style. May be repeated for credit when content is different.

HISTORY

Edmund F. Kallina, Jr. Graduate Program Coordinator
Office: HFA 505A, Phone (407) 275-2224

<i>T. Colbourn, Ph.D.</i>	Professor
<i>R. C. Crepeau, Ph.D.</i>	Professor
<i>J. B. Fernandez, Ph.D.</i>	Professor
<i>B. F. Pauley, Ph.D.</i>	Professor
<i>J. H. Shofner, Ph.D.</i>	Chair and Professor
<i>P. W. Wehr, Ph.D.</i>	Professor
<i>J. L. Evans, Ph.D.</i>	Associate Professor
<i>E. B. Fetscher, Ph.D.</i>	Associate Professor
<i>E. F. Kallina, Jr., Ph.D.</i>	Associate Professor
<i>S. A. Leckie, Ph.D.</i>	Associate Professor
<i>T. D. Greenhaw, Ph.D.</i>	Assistant Professor

Admission

The Graduate Record Examination (GRE) is required of all graduate students. Minimal requirements for admission to the program are a grade point average (GPA) of 3.0 for the last 60 semester hours of undergraduate study and a score of at least 500 on the verbal section of the General (Aptitude) test of the Graduate Record Examination (GRE).

Program in History

The Master of Arts in History is aimed at providing for the academic growth of secondary school teachers, preparing students for Ph.D. work, and providing graduate courses for individuals who wish to enrich their intellectual lives. Departmental areas of research include American cultural and social history, local history, the American frontier, twentieth-century mass movements, and Nazism and anti-Semitism in Central Europe, as well as many other areas.

Master of Arts Degree Requirements—History

The Master of Arts in History requires 36 semester hours with no graduate credit given for any grade lower than "B." Specific requirements are:

HIS 6159	Historiography	3 hours
HIS 6971	Thesis	6-9 hours
Area of Concentration (American or European)		18 hours
Outside Area of Concentration in History		6-9 hours
Electives		0-3 hours

Students will also be expected to demonstrate a reading competence in one foreign language.

EXAMINATION REQUIREMENTS

Each candidate for the Master of Arts in History must pass a written examination upon the conclusion of regular course work. Each candidate will also be expected to conduct a thesis defense.

History Courses

NOTE: All graduate colloquia listed below require intensive reading in the literature of a given field, class discussions, and the preparation of papers. The prerequisites for 5000-level courses are senior standing and the consent of the instructor. All seminars listed below involve supervised research and the writing of term papers. The consent of the instructor is required for every seminar.

AMH 5116 Colloquium in U.S. Colonial History	3 cr (3,0)
AMH 5137 Colloquium in U.S. Revolutionary Period	3 cr (3,0)
AMH 5149 Colloquium in Early U.S. History, 1789-1815	3 cr (3,0)
Covers the early national period.	

AMH 5169 Colloquium in the Age of Jackson	3 cr (3,0)
AMH 5176 Colloquium in Civil War and Reconstruction	3 cr (3,0)
AMH 5219 Colloquium in Late 19th Century U.S.	3 cr (3,0)
AMH 5296 Colloquium in 20th Century U.S.	3 cr (3,0)
AMH 5391 Colloquium in U.S. Cultural History	3 cr (3,0)
AMH 5407 Colloquium in the American South Covers topics of Southern history from colonial origins to the present.	3 cr (3,0)
AMH 5446 Colloquium in U.S. Frontier	3 cr (3,0)
AMH 5508 Colloquium in Women in American History.	
AMH 5515 Colloquium in U.S. Diplomatic History	3 cr (3,0)
AMH 6179 Seminar in the Civil War and Reconstruction	3 cr (3,0)
AMH 6218 Seminar in Late 19th Century U.S.	3 cr (3,0)
AMH 6356 Seminar in U.S. Politics	3 cr (3,0)
AMH 6393 Seminar in U.S. Cultural History	3 cr (3,0)
AMH 6408 Seminar in American South	3 cr (3,0)
AMH 6447 Seminar in U.S. Frontier	3 cr (3,0)
AMH 6499 Seminar in Local History	3 cr (3,0)
AMH 6508 Seminar in Women in American History	
EUH 5237 Colloquium in Europe from 1815-1848	3 cr (3,0)
EUH 5238 Colloquium in Europe from 1848-1914	3 cr (3,0)
EUH 5247 Colloquium in Europe from 1919-1939	3 cr (3,0)
EUH 5285 Colloquium in Europe Since World War II	3 cr (3,0)
EUH 5371 Colloquium in Spanish History	3 cr (3,0)
EUH 5517 Colloquium: Tudor-Stuart England	3 cr (3,0)
EUH 5527 Colloquium in 18th Century England	3 cr (3,0)
EUH 5579 Colloquium in Soviet Russia	3 cr (3,0)
EUH 5595 Colloquium in Czarist Russia	3 cr (3,0)
EUH 5608 Colloquium in European Intellectual History	3 cr (3,0)
EUH 6248 Seminar in Fascist Dictators Compares the causes, characteristics and failures of fascist movements and dictators in Germany, Italy, Austria and other European countries from 1918-1945.	3 cr (3,0)
EUH 6288 Seminar in Europe after World War II	3 cr (3,0)
HIS 6159 Historiography Selected topics in the study of history. May be repeated for credit on consent of instructor.	3 cr (3,0)
HIS 6946 Teaching Practicum Student observation, participation, direction, and leadership in a college survey course.	3 cr (3,0)
HIS 6971 Thesis	1-6 cr (1-6,0)

LAH 6308 Seminar in 20th Century Latin American History

3 cr (3,0)

A seminar analyzing contemporary Latin American issues, such as militarism, revolutionary movements, social and economic reforms, from a historical perspective.

MATHEMATICAL SCIENCE

Larry C. Andrews Graduate Program Coordinator
Office: PH 409, Phone (407) 823-6284

L. C. Andrews, Ph.D.	Professor
R. C. Brigham, Ph.D.	Professor
L. Debnath, Ph.D.	Chair and Professor
R. N. Mohapatra, Ph.D.	Professor
A. J. Pettofrezzo, Ph.D.	Professor
H. Sherwood, Ph.D.	Professor
B. K. Shivamoggi, Ph.D.	Professor
J. M. Anthony, Ph.D.	Associate Professor
L. H. Armstrong, Ph.D.	Associate Professor
M. N. Heinzer, Ph.D.	Associate Professor
P. Mikusinski, Ph.D.	Associate Professor
E. Norman, Ph.D.	Associate Professor
C. P. Rautenstrauch, Ph.D.	Associate Professor
G. D. Richardson, Ph.D.	Associate Professor
R. Rodriguez, Ph.D.	Associate Professor
M. D. Taylor, Ph.D.	Associate Professor
K. Vajravelu, Ph.D.	Associate Professor
A. I. Zayed, Ph.D.	Associate Professor
R. M. Caron, Ph.D.	Assistant Professor
S. R. Choudhury, Ph.D.	Assistant Professor
J. W. Hurst	Assistant Professor
R. C. Jones, Ph.D.	Assistant Professor
M. Z. Malik, Ph.D.	Assistant Professor
F. Salzmann, Ph.D.	Assistant Professor

Joint Appointee:

R. L. Phillips, Ph.D.Professor of Engineering

Several faculty members are active in mathematics research, some of which is supported by external grants.

Admission

The Graduate Record Examination (GRE) is required of all graduate students. Admission requirements are the standard University criteria of a 3.0 grade point average (GPA) for the last 60 semester hours of credit earned towards the baccalaureate or a GRE score of at least 1000 for the combined verbal-quantitative sections of the General (Aptitude) Test. The GRE must be less than 5 years old.

Additionally, students entering the graduate program with regular status are assumed to have a working knowledge in such areas as calculus, differential equations, linear algebra (or matrix theory), boundary value problems, with statistics and computer programming at the undergraduate level. Those students who find they are not adequately prepared in one or more of these areas can select appropriate courses from the undergraduate curriculum to make up such deficiencies. Applicants not qualified for regular status may be initially admitted to the University in a post-baccalaureate status.

Program in Mathematical Science

The Master of Science degree program in Mathematical Science is an interdisciplinary program intended to provide a broad base in applied mathematics, statistics, and computer

science. The program is available in the evening hours to accommodate the working student.

Master of Science Degree Requirements

The Mathematical Science degree requires a total of 30 credit hours, with a minimum of 24 hours of course work.

REQUIRED COURSES:

24 Semester Hours

A minimum of 24 semester hours must include graduate level mathematics, statistics, and computer science courses which are approved by the student's committee. Suggested courses in these areas are listed below:

Suggested mathematics courses:

MAA 5210	Topics in Advanced Calculus	4 hours
MAP 5405	Techniques of Complex Variables	3 hours
MAP 5407	Applied Mathematics I	3 hours
MAP 6408	Applied Mathematics II	3 hours

Suggested statistics courses (See Statistics Department):

STA 6447	Introduction to Probability	3 hours
STA 6354	Theory of Statistics	3 hours

Suggested computer science courses (See Computer Science Department):

COT 6505	Computational Methods/Analysis	3 hours
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RESTRICTED ELECTIVES

1-4 Semester Hours

Electives may be chosen from approved mathematics, statistics or computer science courses which are taught by the Department of Mathematics, Department of Statistics or the Department of Computer Science. Graduate courses outside these departments may also be used if approved by the student's committee.

THESIS OR RESEARCH REPORT

2-6 Semester Hours

Anywhere from 2 to 6 semester hours of credit may be given for the writing of a paper on an appropriate topic. Ordinarily a paper which is of sufficient magnitude to justify awarding more than 4 hours of credit is considered a thesis. Otherwise it is considered a research report.

An oral defense of the thesis or research report will be required.

EXAMINATION REQUIREMENTS

A final examination for either option may be given at the discretion of the student's committee.

Total Minimum Semester Hours Required: 30

Mathematical Science Courses

MAA 5210 Topics in Advanced Calculus

4 cr (4,0)

PR: MAC 3313 or C.I. Selected topics in multivariable calculus including limits, continuity, Euler's theorem, the Jacobian, and double series; extension of single variable concepts including uniform convergence and improper integrals.

MAA 6105 Hilbert Spaces with Applications

3 cr (3,0)

PR: MAP 3302, MAS 3106 or C.I. Normed and inner product spaces; Hilbert spaces; orthonormal systems; linear operators and spectral decomposition; applications to differential and integral equations.

MAD 5205 Combinatorics and Graph Theory II

3 cr (3,0)

PR: MAD 4203 or C.I. Polya's theory of counting; Latin squares and rectangles; block designs; coding theory; probabilistic methods; hypergraphs; applications.

MAD 6309 Advanced Graph Theory I

3 cr (3,0)

A seminar devoted mainly to reading papers and presenting their content. Advanced areas of graph theory will be covered. Primarily for Ph.D. students in Computer Science.

MAP 5302 Splines and Data Fitting

3 cr (3,0)

PR: MAP 3302, MAS 3105 or 3106, or C.I. Topics on univariate splines and data fitting; applications to regression analysis, differential and integral equations; algorithms for different types of splines.

MAP 5405 Techniques of Complex Variables

3 cr (3,0)

PR: MAC 3313 or C.I. Analytic functions; integration in the complex plane; Laurent series and residue calculus, inversion of Laplace transforms; conformal mappings; application in engineering and the physical sciences.

MAP 5407 Applied Mathematics I

3 cr (3,0)

PR: MAP 3302 or C.I. Calculus of variations, Hamilton's principle, eigenvalues and stationary points, Rayleigh-Ritz method, differential equations, and approximation methods.

MAP 5426 Special Functions

3 cr (3,0)

PR: MAP 3302 or C.I. Series and integral representations, generating functions, recurrence relations and orthogonality properties of the special functions. Emphasis on Bessel, Legendre, and hypergeometric functions.

MAP 6104 Introduction to Nonlinear Dynamics

3 cr (3,0)

PR: MAP 3302, PHY 3048 or equivalent, or C.I. Nonlinear differential equations; bifurcation theory; Hamiltonian dynamics; integrable systems and breakdown of integrability; chaos in conservative and dissipative systems.

MAP 6356 Partial Differential Equations

3 cr (3,0)

PR: MAP 3302 or C.I. First and second order linear equations; classification and analytical methods of solution; Green's functions and integral representations; applications in engineering and physical sciences.

MAP 6408 Applied Mathematics II

3 cr (3,0)

PR: MAP 5407, MAA 5210 or C.I. Linear vector spaces and linear operators, eigenvalue problems in Hilbert space, Fourier series, integral equations, partial differential equations and orthogonal functions.

MAP 6424 Transform Methods

3 cr (3,0)

PR: MAA 5405 or C.I. Laplace, Fourier, Hankel and other integral transforms, inversion theorems; the Z transform; applications to physical problems.

MAP 6445 Approximation Techniques

3 cr (3,0)

PR: MAA 4228 or MAA 5211 or C.I. Normed linear spaces; Weierstrass approximation theorem; Tchebycheff approximation by polynomials; trigonometric approximation; orthogonal expansions and least squares approximations.

MAS 5115 Matrix Theory and Its Applications

3 cr (3,0)

PR: MAS 3113, STA 4322. Basic theory of determinants, inverses, generalized inverses, eigenvalues and eigenvectors; partitioned matrices; diagonalization and decomposition theorems; least squares; and applications.

MAP 6971 Thesis

2-6 cr

MUSIC

Edward R. Hotaling Acting Chair
Office: FA 105A, Phone (407) 275-2869

Music Courses

MUT 5325 Arranging and Composing Music 2 cr (2,0)

PR: Satisfactory placement tests in theory, sight-singing, and ear training. Arranging and composing music for instrumental and vocal ensembles. Some emphasis on compositional techniques of the 20th century.

MVB 5451 Trumpet V* 2 cr (1,0)

MVB 5452 French Horn V* 2 cr (1,0)

MVB 5453 Trombone V* 2 cr (1,0)

MVB 5454 Baritone V* 2 cr (1,0)

MVB 5455 Tuba V* 2 cr (1,0)

MVK 5451 Piano V* 2 cr (1,0)

MVK 5453 Organ V* 2 cr (1,0)

MVO 5250 Advanced Secondary Instruction 1 cr (1,0)

PR: Graduate standing and C.I. Advanced instructional techniques on a secondary instrument or in voice. May be repeated for credit.

MVP 5451 Percussion V* 2 cr (1,0)

MVS 5451 Violin V* 2 cr (1,0)

MVS 5452 Viola V* 2 cr (1,0)

MVS 5453 Cello V* 2 cr (1,0)

MVS 5454 Bass V* 2 cr (1,0)

MVS 5455 Harp V* 2 cr (1,0)

MVS 5456 Guitar V* 2 cr (1,0)

MVV 5451 Voice V* 2 cr (1,0)

MVW 5451 Flute V* 2 cr (1,0)

MVW 5452 Oboe V* 2 cr (1,0)

MVW 5453 Clarinet V* 2 cr (1,0)

MVW 5454 Bassoon V* 2 cr (1,0)

MVW 5455 Saxophone V* 2 cr (1,0)

*PR: C.I. required for these courses.

PHYSICS

C. Denise Caldwell Graduate Program Coordinator
Office: HPB 310, Phone (407) 823-2325

M. Bass, Ph.D. Vice President for Research
and Professor

J. R. Bolte, Ph.D.	Vice President of Administration and Finance and Professor
S. K. Bose, Ph.D.	Chair and Professor
J. J. Brennan, Ph.D.	Professor
B. Chai, Ph.D.	Professor
L. Elias, Ph.D.	Professor
J. Kim, Ph.D.	Professor
R. A. Llewellyn, Ph.D.	Professor
A. Miller, Ph.D.	Professor
J. E. Neighbor, Ph.D.	Associate Vice President for Academic Affairs and Professor
M. Richardson, Ph.D.	Professor
W. Silfvast, Ph.D.	Professor
M. J. Soileau, Ph.D.	Director of CREOL and Professor
G. Stegeman, Ph.D.	Cobb-Hooker Eminent Scholar Chair of Optical and Laser Sciences and Engineering
E. W. Van Stryland, Ph.D.	Professor
J. S. Bolemon, Ph.D.	Associate Professor
C. D. Caldwell, Ph.D.	Associate Professor
L. Chow, Ph.D.	Associate Professor
K. Guenther, Ph.D.	Associate Professor
H. Saha, Ph.D.	Associate Professor
D. Hagan, Ph.D.	Assistant Professor
O. Heinonen, Ph.D.	Assistant Professor
M. Johnson, Ph.D.	Assistant Professor
A. Schulte, Ph.D.	Assistant Professor
I. Littlewood, Ph.D.	Assistant Professor
I. Kimel, Ph.D.	Adjunct Professor
N. Ying, Ph.D.	Adjunct Professor

Admission

The Graduate Record Examination (GRE) is required of all graduate students. *Minimum requirements in order to be considered for admission to the graduate program in Physics are the standard University criteria of a 3.0 (A=4) grade point average (GPA) for the last 60 semester hours of credit earned towards the baccalaureate or a GRE score of at least 1000 on the combined verbal-quantitative sections of the General (Aptitude) Test. In addition, students entering the graduate program with regular status are expected to have completed the following undergraduate courses or their equivalent:

*NOTE: Meeting minimum University admission standards for graduate status may not satisfy doctoral program admission requirements. Additional or higher criteria may be required.

PHY	4043	Mechanics
PHY	3044	Electricity, Magnetism, and Electromagnetic Waves
PHY	3503	Thermodynamics
PHY	3101	Modern Physics
PHY	3722C	Physics of Scientific Instruments
PHY	4604	Wave Mechanics
PSZ	3151	Computational Physics
MAP	3302	Differential Equations

Applicants not qualified for regular status may be initially admitted to post-baccalaureate status and later admitted to regular graduate status once the deficiencies have been satisfied. All admissions to graduate status are competitive and based on availability of faculty for sponsoring research. The admission deadline for the fall semester of each academic year will be March 31 of the preceding spring. An exception may be granted if extreme circumstances warrant, but this may only be done with full approval of the Graduate Program Committee of the Department.

Program in Physics

The Department of Physics offers a Master of Science degree and a Doctor of Philosophy degree. Course work and research opportunities are available in optics, laser physics, quantum theory, electromagnetics, semiconductor physics, molecular physics, thin films, nonlinear phenomena, quantum-limited processes, and x-ray studies. Currently, active research projects include nonlinear phenomena in intense electromagnetic fields, nonlinear wave propagation, atomic and molecular physics, high temperature superconducting materials, ultra-high pressure diamond anvil research, Mossbauer spectroscopy, dye lasers, laser annealing, x-ray lithography, energy systems, and organic semiconductors. Many opportunities exist to interact with local optics, laser, and other high technology industries. Planned programs leading to specialization in research within the Center for Research in Electro-Optics and Lasers (CREOL) are also available.

Master of Science Degree Requirements—Physics

The Master of Science in Physics degree requires a total of 33 semester credit hours, with a minimum of 27 hours of course work and 6 hours of thesis. The course work is divided into core requirements (15 hours) and electives (12 hours). All electives must be approved by the student's advisory committee.

Core Courses			15 Hours
PHY	6246	Classical Mechanics	3 hours
PHY	5524	Statistical Physics	3 hours
PHY	5346	Electrodynamics I	3 hours
PHY	5606	Quantum Mechanics I	3 hours
PHY	6624	Quantum Mechanics II	3 hours
Electives			12 Hours

A minimum of 3 semester hours must be selected from the following:

PHY	5446	Laser Principles	3 hours
PHZ	5405	Condensed Matter Physics	3 hours
PHZ	5304	Nuclear Physics	3 hours
PHZ	5505	Plasma Physics	3 hours
PHY	6347	Electrodynamics II	3 hours

A minimum of 6 semester hours of electives in addition to the above.

THESIS

6 Hours

The Master of Science in Physics candidate is required to conduct a program of original scientific research or some other investigation involving a creative element and to submit a written thesis detailing these investigations. An oral defense and examination of the thesis is required.

Total Minimum Semester Hours Required:

33

Doctor of Philosophy Degree Requirements—Physics

The total program consists of 72 hours of course work, of which 15 are required dissertation hours. The remaining 57 hours are divided into 21 hours of core courses, 6 hours of required research, and 30 hours of electives. Of these 30 hours, no more than 6 may be in research, resulting in no more than a total of 12 hours of research prior to the dissertation. In addition, 6 hours must be in areas outside of the physics program, e.g. mathematics, engineering, computer science, etc. The 6 semester hours of courses outside of Physics will be chosen by the student in consultation with the Graduate Program Coordinator of the Department. In addition, each student will be required to participate in the Physics Colloquium/Lecture program.

Core Courses			21 semester hours
PHY	6246	Classical Mechanics	3 hours
PHY	5524	Statistical Physics	3 hours
PHY	5346	Electrodynamics I	3 hours
PHY	6347	Electrodynamics II	3 hours
PHY	5606	Quantum Mechanics I	3 hours

PHY	6624	Quantum Mechanics II	3 hours
PHZ	6115	Theoretical Methods	3 hours

Elective Courses

30 semester hours

Thirty (30) semester hours from the following, with at least 3 hours taken outside the student's research specialty:

PHZ	6115	Theoretical Methods	3 hours
PHY	5446	Laser principles	3 hours
PHY	6447	Laser Physics	3 hours
PHY	6448	Specific Laser Systems	3 hours
PHY	6434	Non-linear Optics	3 hours
PHZ	5405	Condensed Matter Physics	3 hours
PHZ	6425	Advanced Condensed Matter Physics	3 hours
PHY	5431	Optical Properties of Materials I	3 hours
PHY	6424	Optical Properties of Solids	3 hours
PHY	6655	Advanced Quantum Mechanics	3 hours
PHY	6204	Atomic and Molecular Spectroscopy	3 hours
PHZ	6156	Advanced Computational Physics	3 hours
PHY	6353	Accelerator Physics	3 hours
PHY	6355	Physics of Free Electrons	3 hours
PHY	6918	Directed Research	3 hours
PHY	6938	Special Topics/Seminars	3 hours
PHZ	5304	Nuclear Physics	3 hours
PHZ	5505	Plasma Physics	3 hours

QUALIFYING EXAMINATION

Admission into Doctoral Status is contingent upon passing a Qualifying Examination. This examination will cover all material included in the Core Courses. The examination consists of both written and oral portions and will be administered by a committee appointed by the Chair. Typically, students having completed three semesters of graduate study will sit for this exam. However, it will be open to all students who wish to attempt it. The exam may be attempted no more than twice, if the first attempt should result in failure. A student failing at the second attempt will not be permitted to take the candidacy examination and continue in pre-doctoral status.

CANDIDACY EXAMINATION

This is a brief written examination which covers the course work and general knowledge in that specialty area in which the student expects to perform the research required for the dissertation. This will typically be the same as that in which the 6 hours of required research were conducted. This examination will be administered by a committee which is chosen by the faculty sponsor of the research. The graded results of this examination will go on file in the Office of the Dean. Following the rules established by the Graduate Council, this examination will take place after all course work has been completed.

DISSERTATION PROPOSAL

After passing the candidacy examination, a student in the program will write a dissertation proposal describing the dissertation topic to be chosen by the candidate, followed by an oral examination covering the details of the student's research project. The examination will be administered by the student's research advisor and the dissertation committee. The dissertation advisor will serve as the chair of the dissertation committee. After passing this examination, the student may register for dissertation hours.

DISSERTATION DEFENSE

This is the final oral defense of the dissertation. It will be administered by the student's dissertation committee following completion of a written dissertation describing the student's research.

Physics Courses

PHY 5240 Advanced Mechanics

3 cr (3,0)

PR: PHY 4220 or C.I. Elements of continuum mechanics. Generalized coordinates, virtual work, Lagrange's equations, Hamilton's equation. Inertia tensors, stress tensors. Eulerian description of rigid body motion. Theory of small vibrations.

PHY 5346 Electrodynamics I

3 cr (3,0)

PR: PHY 3320, MAP 3302, or C.I. Boundary value problems in electrostatics and magnetostatics. Maxwells equations; EM fields in matter; wave generation and propagation; wave guides; and resonant cavities.

PHY 5446 Laser Principles

3 cr (3,0)

PR: PHY 3101, MAP 3302, PHY 4424. Classical introduction to the basic principles of laser gain media, properties of laser resonators and modes, description of specific laser systems.

PHY 5431 Optical Properties of Materials

3 cr (3,0)

PR: PHY 4324, MAP 3302, PHY 4424. Normal modes (dipole and Raman active); microscopic theory of absorption, dispersion, and refraction; wave propagation, crystal optics; scattering mechanisms, optical activity.

PHY 5524 Statistical Physics

3 cr (3,0)

PR: PHY 3046, STA 3032, PHY 4045 or C.I. A study of physical concepts and methods appropriate for the description of systems involving many particles. Ensemble theory, partition functions. Maxwell-Boltzmann, Bose-Einstein, Fermi-Dirac statistics.

PHY 5606 Quantum Mechanics I

3 cr (3,0)

PR: PHY 4604 or C.I. Basic postulates of quantum mechanics, operators, eigenvalues, parity, potential wells, harmonic oscillator, time dependent and time independent Schrodinger equation, matrix formulation, and time independent perturbation theory.

PHY 6246 Classical Mechanics

3 cr (3,0)

PR: PHY 5240 or C.I. Variational principles. Lagrange, Hamiltonian, and Poisson bracket formulations of mechanics. Hamilton's principle of least action. Hamilton-Jacobi theory. Perturbation theory. Continuous systems.

PHY 6347 Electrodynamics II

3 cr (3,0)

PR: PHY 5346 or C.I. Dynamics of charged particles in electromagnetic fields. Antennas; radiation by moving charges; magnetohydrodynamics; and multipole radiation.

PHZ 6156 Advanced Computational Physics

3 cr (3,0)

PR: PHZ 3151. Computational methods applied to the solution of problems in Atomic and molecular physics and Solid State physics.

PHY 6434 Nonlinear Optics

3 cr (2.5, 0.5)

PR: PHY 5346. Maxwell's equations in nonlinear media, frequency conversion techniques (SHG, SFG, OPO), stimulated scattering, phase conjugation, wave-guided optics, nonlinear crystals.

PHY 6448 Specific Laser Systems

3 cr (3,0)

PR: PHY 5446 or 6560 or C.I. Review of Laser Principles, Specifics of gas, ion, solid state, dye, metal vapor, free electron, and semiconductor lasers and power supplies.

PHY 6424 Optical Properties of Solids

3 cr (3,0)

PR: PHY 5431, PHY 5606, PHY 5346. Interband transitions, free carriers, excitons, plasmas in metals and semiconductors; k.p theory, low dimensional structures, dynamic nonlinear interactions, multiphoton absorption.

PHY 6204 Atomic and Molecular Spectroscopy

3 cr (3,0)

PR: PHY 5606. Atomic structure, LS and jj coupling, Diatomic molecular spectra, Anharmonic oscillator, Polyatomic molecular spectra, Normal modes of vibration, Dipole selection rules, Franck-Condon principle, Spectroscopic techniques.

PHY 6353 Accelerator Physics

3 cr (3,0)

PR: PHY 5346, PHY 6347. Dynamics of charged particles in electromagnetic fields, electron optics, details of the electrostatic accelerator, the linear accelerator, and cyclic accelerators; properties of cavities and orbiting electrons; new accelerator schemes, including the free electron laser.

- PHY 6355 Physics of Free Electrons** **3 cr (3,0)**
 PR: PHY 5346, PHY 6347. Interaction between electrons and fields, transmission lines, microwave tubes and waveguides, synchrotron radiation and undulators, the free electron laser in both the Compton and Raman regimes.
- PHY 6234 Atomic Physics** **3 cr (3,0)**
 PR: PHY 5606. Brief review of spectroscopy, photoionization, inner shell processes, Auger effect, atom-atom collisions, electron-atom collisions, spin polarization.
- PHY 6447 Laser Physics** **3 cr (3,0)**
 PR: PHY 5606, PHY 5346, PHY 5446. Semiclassical treatment of light/matter interactions (quantized atomic states plus Maxwell's equations). Density matrix theory, coherent optical transients, pulse propagation.
- PHY 6624 Quantum Mechanics II** **3 cr (3,0)**
 PR: PHY 5606 or C.I. Time dependent perturbation theory, exchange symmetry, Dirac Equation, second quantization, and scattering theory.
- PHY 6655 Advanced Quantum Mechanics** **3 cr (3,0)**
 PR: PHY 5606, PHY 6624. This course will introduce the advanced graduate students to the methods of Quantum field theory, essential for the understanding of many branches of physics.
- PHZ 5304 Nuclear Physics** **3 cr (3,0)**
 PR: PHY 4045 or C.I. Nuclear forces, structure, models, reactions, radioactivity, fission, fusion, strange particles.
- PHZ 5405 Condensed Matter Physics** **3 cr (3,0)**
 PR: PHY 4604, PHY 3101 or C.I. Crystal lattice cell structure, phonons, free electron model, band theory of solids, Fermi surface, solid state applications, polymers.
- PHY 5505 Plasma Physics** **3 cr (3,0)**
 PR: PHY 4220, PHY 3044, or C.I. Introduction to theory and experimental basis of both weakly and highly ionized plasmas. Instabilities, plasma waves, nonlinear effects, controlled thermonuclear fusion.
- PHZ 6115 Theoretical Methods** **3 cr (3,0)**
 Basic Mathematical methods applicable to all branches of physics.
- PHZ 6425 Advanced Condensed Matter Physics** **3 cr (3,0)**
 PR: PHY 5606, PHY 6624, PHZ 5405. Many-body techniques in condensed matter physics.
- PHZ 6971 Thesis** **6 cr**

Physics Courses for Teachers

- PHY 5081C Physics of Astronomy for Teachers** **1 cr (0.5,1.5)**
 PR: C.I. Laws of Motion, Law of Gravity, Kepler's Laws, two body orbits, light and spectroscopy, the doppler shift, blackbody radiation, Gas Laws and stellar evolution.
- PHY 5100 Topics in Contemporary Physics for Teachers** **1 cr (1,0)**
 PR: C.I. The study of recent findings in a selected area such as particle physics, surface physics, planetary atmospheres; lasers; geophysics, etc.
- PHY 5015C Physics For Teachers** **3 cr (2,2)**
 C.I. Hands-on lecture-lab course. Dynamics, electricity, magnetism, optics, nuclear radiation.
- PHY 5200C Newtonian Mechanics for Teachers** **1 cr (0.5,1.5)**
 PR: C.I. A lab, lecture, demonstration course studying selected topics in classical mechanics.
- PHZ 5150C Computer Methods in Physics for Teachers** **1 cr (0.5,1.5)**
 PR: C.I. Trajectories with air resistance, trajectories in rotating space colonies, refraction of waves in continuous media, luminosity patterns, temperature profiles.
- PHZ 5301C Nuclear Physics for Teachers** **1 cr (0.5,1.5)**
 PR: C.I. The interaction of ionizing radiation with matter, alpha, beta, gamma decay, fission, fusion, neutron activation, half lives and equilibrium.
- PHY 5300C Electricity for Teachers** **1 cr (0.5,1.5)**
 PR: C.I. Circuits, multimeters, oscilloscopes, circuit elements.

PHY 5302C Electromagnetism for Teachers

1 cr (0.5,1.5)

PR: C.I. Gauss' Law, Biot-Savart Law, Amperes Law, Faraday's Law, Lenz's Law; motors, generators, AC circuits and Maxwell's equations.

PHY 5401C Optics for Teachers

1 cr (0.5,1.5)

PR: C.I. Geometrical and physical optics, spectrometers and lasers.

PHY 5500C Thermal Physics for Teachers

1 cr (0.5,1.5)

PR: C.I. Engines, heat pumps, kinetic theory, phase changes, radiation, weather.

PHZ 5600 Special Relativity for Teachers

1 cr (1.0)

PR: C.I. Length contraction, time dilation, simultaneity, conservation of mass-energy, conservation of momentum, Compton scattering.

PHY 5601 Quantum Physics for Teachers

1 cr (1,0)

PR: C.I. Hydrogen atom, diatomic molecules, heat capacity transition rates.

PHZ 5800C Wave Motion for Teachers

1 cr (0.5,1.5)

PR: C.I. Water waves, waves on strings, sound and vibrations.

POLITICAL SCIENCE

Philip H. Pollock III Graduate Program Coordinator

Joan Johnson-Freese Co-Coordinator

Office: HFA 426, Phone (407) 823-2608

R. Bledsoe, Ph.D. Professor

R. Handberg, Ph.D. Professor

H. Kennedy, Ph.D. Professor

M. Stern, Ph.D. Professor

J. Johnson-Freese, Ph.D. Associate Professor

J. R. Lillie, Ph.D. Associate Professor

S. A. Lilie, Ph.D. Dean of Undergraduate Studies

& Associate Professor

W. Q. Morales, Ph.D. Associate Professor

<i>W. G. Morales, Ph.D.</i>	Associate Professor
<i>P. H. Pollock, Ph.D.</i>	Associate Professor

M. E. Vettes, Ph.D. Chair & Associate Professor

A. Celso, Ph.D. Assistant Professor

T. S. Fine, Ph.D. Assistant Professor

D. Kiel, Ph.D. Assistant Professor

R. Kurfirst, Ph.D. Assistant Professor

I. Master of Arts in Political Science

The Master of Arts in Political Science degree program is designed to accommodate a range of professional and intellectual needs. These include: (1) preparing students to enter positions in government and the private sector in which the ability to comprehend, influence, and respond to government policy is critical; (2) preparing students, through the M.A., for pursuit of a Ph.D. degree in Political Science at other institutions; and, (3) providing a well-rounded substantive curriculum for secondary school teachers seeking higher degrees, and for teachers in community colleges.

II. Admission to the Political Science Program

Minimum requirements for admission to UCF as a post-baccalaureate student are outlined in the graduate catalog. In addition, any student wishing to enroll in graduate courses in political science must meet the Department's requirements for Graduate Status (either Classified or Conditional Graduate Status), or must hold regular graduate status in another program at UCF.

Requirements for Classified Graduate Status are:

1. At least 12 semester hours of undergraduate course work in political science, including Scope and Methods of Political Science (POS 3703) or its equivalent. Students must have a grade of B or better in this course work.

AND

2. Three letters of recommendation from individuals who can attest to the applicant's potential for graduate work. These letters should address the applicant's ability to think analytically and to communicate clearly.

AND

3. An undergraduate grade point average of at least 3.0 overall.

OR

4. A combined (quantitative and verbal) GRE score of at least 1000.

Note: All applicants are required to take the GRE. Admission will be denied to any applicant whose GRE score is below 850 (quantitative plus verbal), regardless of his or her undergraduate grade point average.

Conditional Graduate Status

Applicants who are not qualified for Classified Graduate Status may petition by letter the Department's Graduate Committee for admission to Conditional Graduate Status. The applicant's petition must address the specific reasons behind the failure to qualify for classified status. Students holding conditional graduate status must meet the following requirements before applying for classified status:

1. Removal of any deficiencies in undergraduate preparation. Undergraduate preparation includes completion of Scope and Methods of Political Science (POS 3703) or its equivalent and at least one upper division course in each of the following areas: American Politics, International or Comparative Politics, and Political Theory. Students must complete these courses with a grade of B or better.
2. For persons otherwise not qualified for classified graduate status, completion of three graduate courses, with grade B or better.
3. Completion of any other requirements determined by the Graduate Committee and stated on the student's Program of Graduate Study form.

III. Degree Requirements for M.A. Program in Political Science

The Department of Political Science offers students two tracks toward the masters degree. The Political Analysis track provides an in-depth understanding of political life in the American case and in comparative perspective: The nature of institutions, the role of political organizations, and the effect of mass political behavior. The political analysis track is recommended for students who want to enter community college teaching or who wish to seek a doctorate at another institution. The Public Policy track prepares students to handle complex questions arising from key areas of government activity: Issues in science and technology, health and environmental regulation, foreign and defense policy, and other important areas. The public policy track is recommended for students most interested in developing a professional expertise in a policy specialty or who would like to enhance their current sphere of knowledge.

After being admitted (either as classified or conditional), the students must meet with one of the graduate advisors to discuss his or her plans for graduate study and to obtain permission to enroll in graduate courses in the Department. After completing nine hours of course work, all students must determine a preliminary program of study, either in the political analysis or the public policy track. Both tracks require 30 semester hours of credit (24 hours of course work plus 6 hours of thesis) and both share these core requirements:

Quantitative Methods in Political Research

(POS 6746)

3 Hours

Seminar in American Politics

(POS 6045)

3 Hours

Seminar in Political Theory

(POT 6007)

3 Hours

AND

Seminar in International Politics

(INR 6007)

OR

Seminar in Comparative Politics

(CPO 6007)

3 Hours

12 Hours

A program of study in the political analysis track consists of	
Core requirements	12 Hours
Three special topics courses from:	
American Politics (POS 6938)	
Political Theory (POS 6938)	
International Relations (POS 6938)	
Comparative Politics (POS 6938)	
Political Analysis (POS 6938)	9 Hours
Electives	3 Hours
Thesis (POS 6971)	<u>6 Hours</u>
	30 Hours

A program of study in the public policy track consists of:	
Core requirements	12 Hours
Public Policy Analysis (PUP 6007)	3 Hours
Two special topics courses from:	
Science Policy (PUP 6938)	
Social Policy (PUP 6938)	
Foreign & Defense Policy (PUP 6938)	6 Hours
Electives	3 Hours
Thesis (POS 6971)	<u>6 Hours</u>
	30 Hours

The political science seminars provide the common core of knowledge for students in both tracks. The specific subject matter of the topics courses will vary, depending upon the specialization of the instructor or the interests of the students in each track. Upon approval of the Graduate committee, topics courses may be repeated for credit.

Ordinarily, elective credits will be taken within political science. Students wishing to earn elective credits from another department must obtain the approval from the Graduate Committee.

After completion of the 24 hours of course work in their chosen track, a student will form a committee of three advisors and submit a written thesis prospectus which, upon acceptance by the committee, will become a part of the student's permanent file. Guidelines for the prospectus are available from the graduate coordinator. The completed thesis must be submitted to the thesis committee at least eight weeks prior to the date on which the degree is to be awarded. The student will then orally defend the thesis.

EXAMINATION

All candidates for a masters degree must take a comprehensive written examination. The examination will usually be administered after satisfactory completion of 24 hours. The



examination will be based on the political science course work contained in the student's program of study. In addition, all students will be tested in the area of quantitative methods. The examination will be offered two times each academic year, during the final examination period for the Fall and Spring semesters. Students must inform the graduate coordinator of their intention to take the examination at least six weeks prior to its scheduled date. A committee, consisting of all political science faculty from whom the student has taken courses, will develop questions for the comprehensive examination. Students not passing the examination may take it a second time within one calendar year, but no student will be allowed to take the examination more than twice.

Political Science Courses

CPO 6007 Seminar in Comparative Politics 3 cr (3,0)

Introduction to the theory and methodology of comparative politics, institutions, and contextual factors of selected political systems such as Canada, European, and third world nations.

INR 6007 Seminar in International Politics 3 cr (3,0)

Introduces the student to the advances in international relations theory and research through a broad sampling of approaches and methods.

POS 6746 Quantitative Methods in Political Research 3 cr (3,0)

PR: C.I. Methods of model building and research design, including conceptualization and measurement of political variables; techniques of data collection and quantitative analysis; and computer usage.

POS 6045 Seminar in American National Politics 3 cr (3,0)

Examines major aspects of the American system, including mass behavior, public opinion, and political institutions.

POS 6918 Directed Independent Research Variable Credit

POS 6938 Special Topics/Political Analysis 3 cr (3,0)

This course title covers all political analysis special topics courses which are not listed in the catalog with a course number. May be repeated for credit.

POS 6946 Supervised Teaching Internship Variable Credit

POS 6971 Thesis Variable Credit

POT 6007 Seminar in Political Theory 3 cr (3,0)

An examination of analytic and normative theories of politics and society, using selected topics as a substantive focus.

PUP 6007 Public Policy Analysis 3 cr (3,0)

Examination of the role of the state and the policy process (agenda-setting, formulation, implementation), and case studies in environmental, economic, education, or welfare or other policy.

PUP 6938 Special Topics/Public Policy

This course title covers all public policy special topics courses which are not listed in the catalog with a course number. May be repeated for credit.

PSYCHOLOGY

John M. McGuire Graduate Program Coordinator
Office: PH 322, Phone (407) 823-2216 Clinical Psychology Program

Wayne A. Burroughs Graduate Program Coordinator
Office: PH 313, Phone (407) 823-2216 Industrial/Organizational Program

Richard D. GilsonGraduate Program Coordinator
Office: PH 311, Phone (407) 823-2755Human Factors Psychology Program

D. W. Abbott, Ph.D.	Professor
W. A. Burroughs, Ph.D.	Professor
R. D. Gilson, Ph.D.	Professor
J. M. McGuire, Ph.D.	Professor
B. B. Morgan, Jr., Ph.D.	Professor
E. J. Rinalducci, Ph.D.	Professor
J. B. Rollins, Ph.D.	Professor
E. P. Sheridan, Ph.D.	Dean and Professor
K. Sheridan, J.D., Ph.D.	Professor
M. H. Thomas, Ph.D.	Professor
R. D. Tucker, Ph.D.	Chair and Professor
B. I. Blau, Ph.D.	Associate Professor
J. C. Brophy, Ph.D.	Associate Professor
R. D. Fisher, Ph.D.	Associate Professor
B. J. Jensen, Ph.D.	Associate Professor
E. C. Shirkey, Ph.D.	Associate Professor
P. M. Tell, Ph.D.	Associate Professor
J. J. Turnage, Ph.D.	Associate Professor
A. Y. Wang, Ph.D.	Associate Professor
S. S. Guest-Houston, Ph.D.	Assistant Professor
J. L. Dyck, Ph.D.	Assistant Professor
N. C. Silver, Ph.D.	Assistant Professor
J. A. Smither, Ph.D.	Assistant Professor
W. Wooten, Ph.D.	Assistant Professor

Admission

The Graduate Record Examination (GRE) is required of all graduate students. In addition to the University minimum admission criteria of a quantitative-verbal score of 1000 on the GRE or a GPA of 3.0 for the last two years of the baccalaureate degree, three standard letters of reference (at least two from academic sources) must be initiated by the student and sent by the reference directly to the department. A departmental admissions committee reviews the student's credentials and will invite a group of candidates for an interview. Final selection is based on both paper credentials *and* the interview. Admission to the program occurs only in the fall semester.

A completed file, which includes the application, official test scores, letters of reference, and transcripts to date, are due in the department by March 1. (Materials received prior to May 1 may be reviewed for a late admission decision if there are positions available.) Unless there is a complete file by this date, you will not be considered for admission for the forthcoming fall term.

Competency/Prerequisite Requirements

Clinical Program. Applicants must have a baccalaureate degree with a major in psychology or have completed the following undergraduate psychology content course areas prior to matriculation: Introduction to Psychology; Abnormal Psychology; Developmental Psychology (Life Span preferred) or Child Psychology; Personality Theories; Learning; Physiological Psychology; and a course in Research Methods or Statistics.

Industrial/Organizational Program. Applicants must either have a baccalaureate degree with a major in Psychology or a baccalaureate degree and completion of undergraduate psychology courses in statistics and research methods, and four additional upper-division courses (12 semester hours) in the core content areas of psychology.

Programs in Psychology

There are two different Master of Science programs in Psychology.

The Master of Science degree program in Clinical Psychology is concerned with the application of psychological principles to individuals. Major areas of emphasis include assessment or evaluation skills, intervention or counseling and psychotherapy skills, plus an academic foundation in research methods. The program was initiated for the purpose of providing training and preparation at the master's level for individuals desiring to deliver clinical services through community agencies. Graduates have been involved in mental health rehabilitation through individual, marital, family and group psychotherapy, as well as crisis intervention and specialized therapeutic procedures. Graduates have met the education criteria for licensure as mental health counselors in Florida.

The Master of Science degree program in Industrial/Organizational Psychology is concerned with the application of psychological principles to organizations. Major areas of emphasis include selection and training of employees, applied theories of organizational behavior including models of motivation, job satisfaction, and productivity; test theory and construction; assessment center technology; statistics and experimental design and a variety of current topics.

Industrial/Organizational graduates are involved in many issues of critical importance to society including fairness in the selection and treatment of employees, the creation of work environments which maximize the satisfaction and productivity of employees, and the study of technological influences on human performance.

Master of Science Degree Requirements— Clinical Psychology

The M.S. degree program in Clinical Psychology is a two-year, four-semester program for full-time students with no summer course work. The program consists of a minimum of 50 semester hours of work as follows:

ACADEMIC COURSE WORK			31 Semester Hours
CLP	6441	Individual Assessment*	3 hours
CLP	6445	Personality Theory and Assessment*	3 hours
CLP	6456	Individual Counseling--Theory and Practice*	3 hours
CLP	6457	Group Psychotherapy*	3 hours
CLP	6458	Behavior Therapy*	3 hours
CLP	6459	Human Sexuality, Marriage and Family Therapies*	3 hours
CLP	6932	Ethical and Professional Issues in Mental Health Practice*	3 hours
DEP	5057	Developmental Psychology	3 hours
PSB	6446	Advanced Abnormal and Clinical Psychopharmacology	3 hours
PSY	6216	Advanced Research Methodology I	4 hours

* Must coregister for the appropriate section of lab.

**Must coregister with CYP 6948.

LABS			6 Semester Hours
Must coregister for one hour with each course as shown above.			
CLP	6456L	Clinical Lab: Counseling	1 hour
CLP	6457L	Clinical Lab: Group Therapy	1 hour
CLP	6458L	Clinical Lab: Behavior Therapy	1 hour
CLP	6459L	Clinical Lab: Marriage and Family Counseling	1 hour
CLP	6441L	Clinical Lab: Individual Assessment	1 hour
CLP	6445L	Clinical Lab: Personality Assessment	1 hour

INTERNSHIP (See details of program)			6 Semester Hours
CYP	6948	Psychology Internship	6 hours

TREATISE (THESIS OR RESEARCH REPORT)

PSY	6938	Research Planning	7 Semester Hours
PSY	6909	Research Report	1 hour
or			6 hours
PSY	6971	Thesis	6 hours
Total Minimum Semester Hours Required:			50

Clinical Internship Requirement

The purpose of the internship requirement is to provide the M.S. candidate in Clinical Psychology with a comprehensive, practical-based experience under direct supervision. A public agency or nonprofit institution offering services to individuals, with nondiscriminatory practices (including ability to assume financial responsibilities) is the prototype. The intern is assigned to an acceptable agency for two consecutive academic semesters (20 hours per semester). An additional commitment of two hours per week is required for the group of interns to meet with a departmental faculty member for review, feedback and discussions. The intern participates in a wide variety of psychological assessment procedures, including intellectual, personality, educational, neuropsychological and differential diagnosis. A major portion of the training is in the area of psychotherapy/counseling.

The intern is expected to make a presentation at least once during the internship at the agency's formal seminars.

Given the community-based structure of the agency, it is desirable for the intern to have some exposure to the consultation role. It is believed that supervision by qualified and experienced personnel is the primary learning mode by which the intern develops his professional expertise and augments the classroom material previously acquired.

Facilities are provided by the intern or agency for audio and/or video tape recording of selected assessment and intervention experiences. The intern is provided with a system for maintaining an accurate account of his activity during the week. In addition, an Internship Expectation form is completed by the intern and supervisors. A maximum of 20 percent of the training time may be assigned to special services within the agency, or upon approval, in an area of interest to the intern at another facility.

Treatise (Research Report or Thesis)

Each student will satisfactorily complete either a library review research paper or an empirical research project. An oral defense is required.

**Master of Science Degree Requirements—
Industrial/Organizational Psychology**

The M.S. degree program in Industrial/Organizational Psychology is a four-semester program for full-time students with no summer course work; however, practicum placements and thesis research may be completed in the summer. The program consists of a minimum of 40 semester hours of work. The required courses, which are scheduled primarily in the evenings to accommodate working students, are as follows:

Industrial/Organizational Psychology**ACADEMIC CLASS WORK**

			26 Semester Hours
INP	6215	Assessment Centers and Leadership	3 hours
INP	6317	Organizational Psychology and Motivation	3 hours
INP	6605	Training and Performance Appraisal	3 hours
INP	6939	Current Topics and Applied Problems in Industrial/Organizational Psychology	3 hours
PSY	6216	Advanced Research Methodology I	4 hours
PSY	6217	Advanced Research Methodology II	4 hours
PSY	6308	Psychological Testing I	3 hours
PSY	6318	Applied Testing and Selection	3 hours

PRACTICA AND LABS

INP	6946	Industrial Psychology Practicum I	6 Semester Hours
INP	6947	Industrial Psychology Practicum II	3 hours
			3 hours

TREATISE (THESIS)

PSY	6971	Treatise (Thesis)	8 Semester Hours
			8 hours

Total Minimum Semester Hours Required: 40

QUALIFYING EXAMINATIONS

All students in the I/O program must pass a qualifying examination which is administered in March of the second year and covers all course work to that point.

PRACTICA

Practicum assignments serve to provide the student with experience in an applied setting while also aiding the organization in which the practicum occurs to meet some specific project need. Practica possibilities generated by the I/O faculty and students may involve settings in private industry, federal, state, or local government, educational institutions, or consulting firms.

Practicum assignments involve one semester commitments ranging from 12-15 hours per week on the part of the student. Depending on the nature of the assignment, this time may be distributed between the organization, library, field work, etc., in a variety of ways.

For each practicum a meeting is held between the student, the supervising faculty member, and a representative of the organization in which the work will be accomplished. Behavioral objectives are agreed upon, and it is expected that the student will carry out these objectives during the assigned time. Each practicum placement is supervised by a faculty member and the student is also responsible to the "contact" person in the organization where the work is occurring. Full-time students are typically assigned practicum projects for the fall and spring terms of their second year.

TREATISE (THESIS)

The I/O program requires that the student complete an empirical research thesis with an oral defense.

Doctor of Philosophy Degree Program**Human Factors Psychology**

A Ph.D. degree program in Human Factors Psychology is offered. The program seeks to develop the capacity to design, conduct and apply human factors research in a variety of professional settings. It is patterned on the scientist-practitioner model of the American Psychological Association (APA) and adheres to guidelines established by the committee for Education and Training of APA's Division 21 (Applied Experimental and Engineering Psychology). The program is designed to meet the accreditation requirements of the Education Committee of the Human Factors Society. A variety of research, consulting and internship arrangements are included in the program.

Students receive training in the content and techniques of human factors psychology—including statistical and quantitative procedures, experimental design, survey methods, computer techniques and other research methodologies. Students must also select a concentration area, which may be in human-computer interaction, human-machine-environment interface, human performance, human factors in simulation and training or other areas of interest with the advisor's authorization. A dissertation representing a significant research contribution to the field is required.

ADMISSIONS POLICY

The Graduate Record Examination (GRE) is required of all applicants. To be considered for acceptance as a regular graduate student, successful applicants are expected to have a minimum cumulative GRE score of about 1100 and an undergraduate GPA of about 3.20 in the last two years of study. However, the final admission criteria will normally be more stringent because of the competitiveness of the application process. Students whose native

language is not English will be required to submit scores of at least 550 on the Test of English as a Foreign Language (TOEFL).

In addition, students will not normally be admitted to the program without having completed a minimum amount of basic preparation in content related to experimental psychology. This preparation will be judged on an individual basis but would typically consist of at least 18 semester hours including the following:

1. Courses in Research Methods, microcomputers, and Statistical Methods.
2. General experimental psychology courses, e.g., Learning, Physiological, Perception, Human Learning, Cognition, Motivation and Measurement.

Applicants will be evaluated for program prerequisites and advised of any needs for additional preparation. Previous graduate work will be evaluated for credit on a case-by-case basis.

ADMISSION REQUIREMENTS

To be considered for admission, applicants must present:

1. A completed UCF graduate degree program application form,
2. Evidence of successful completion of undergraduate courses in statistics and in the general area of experimental psychology,
3. Official scores on the Graduate Record Examination (taken within the last five years),
4. Completed transcripts showing a baccalaureate degree and grades for all undergraduate and graduate work,
5. A written statement outlining the student's academic and professional goals, and
6. Three letters of reference, with at least two furnished by college or university professors who are acquainted with the applicant.

A file of all requested material must be submitted by March 1. Acceptance decisions are made only in the Spring semester for admission in the Fall of each year.

RESIDENCY REQUIREMENTS

A minimum of one year full-time student status is required. (Full-time is defined by UCF as a minimum of 9 hours per semester for two contiguous semesters.) Students are advised that the program is designed to be completed in 3-4 years of full-time study.

REQUIRED COURSES

The Doctor of Philosophy degree in Human Factors Psychology requires a total of 90 semester hours of graduate study. All students must complete both the Psychology core and the Allied areas core.

Fall (Year 1)				13 Semester Hours
EXP	5256	Human Factors I		3 hours
PSY	6216	Advanced Research Methodology I		4 hours
EXP	5506	Human Cognition and Learning		3 hours
PSB	5005	Physiological Psychology		3 hours
Spring (Year 1)				11 Semester Hours
EXP	6257	Human Factors II		3 hours
PSY	6217	Advanced Research Methodology II		4 hours
EXP	5208	Sensation and Perception		3 hours
PSY	6938	Research Planning		1 hour
Summer (Year 1)				6 Semester Hours
EIN	5248C	Ergonomics		3 hours
PSY	6918	Directed Research		3 hours
Fall (Year 2)				12 Semester Hours
EXP	5255	Human Performance		3 hours
INP	6317	Organizational Psychology and Motivation		3 hours
PSY	6918	Directed Research		3 hours
Elective*				3 hours

Spring (Year 2)			12 Semester Hours
EXP	6946	Internship	6 hours
PSY	6919	Research Report	3 hours
Elective*			3 hours
Fall (Year 3)			12 Semester Hours
PSY	6919	Research Report	3 hours
EIN	6258C	Ergonomics in High Tech. Environments	3 hours
EXP	6258	Human Factors III	3 hours
Elective*			3 hours
Spring (Year 3)			12 Semester Hours
EXP	6938	Teaching Seminar	3 hours
PSY	6908	Directed Independent Studies	3 hours
Elective*			3 hours
Elective*			3 hours
Fall (Year 4)			6 Semester Hours
PSY	7980	Doctoral Dissertation	6 hours
Spring (Year 4)			6 Semester Hours
PSY	7980	Doctoral Dissertation	6 hours
Total Minimum Semester Hours Required:			90

***Elective Course Groupings for Selected Concentration Areas:**

Students may choose electives from four elective course groupings: Human-Machine Systems, Environmental Factors, Performance Measurement and Evaluation, or Special Courses. Elective course groupings may be developed for the specific interests of the student.

CANDIDACY EXAMINATIONS

Candidacy examination will be required prior to registering for dissertation.

Psychology Courses

CLP 5004 Psychology of Adult Adjustment **3 cr (3,0)**
 PR: C.I. A survey of situations encountered during adulthood, including marriage, birth, parenthood, trauma, illness, death, etc. Effective adjustment.

CLP 5166 Advanced Abnormal Psychology **3 cr (3,0)**
 PR: C.I. Consideration of classification, causation, management and treatment of emotional disorders. Review of theories and research in the field.

CLP 6416 Biofeedback and Stress **4 cr (2,2)**
 PR: Graduate admission and C.I. Assessment and management of physiological stress response through biofeedback. Biofeedback treatment of stress produced clinical problems.

CLP 6441 Individual Assessment* **3 cr (3,0)**
 PR: Graduate admission and C.I. Theories and techniques of psychological assessment with primary emphasis on interviewing, skills, cognitive assessment and report writing. Experience administering a variety of individual intelligence tests.

CLP 6441L Clinical Lab: Individual Assessment **1 cr (0,2)**
 C.I. Practice in specific techniques in individual assessment. To be taken concurrently with CLP 6441.

CLP 6445 Psychological Theory and Assessment* **3 cr (3,0)**
 PR: CLP 6441, Graduate admission and C.I. Theories of personality and techniques of personality assessment with primary emphasis on interviewing skills, objective and projective techniques, and report writing.

- CLP 6445L Clinical Lab: Personality Assessment** 1 cr (0,2)
C.I. Practice in specific techniques in personality assessment. To be taken concurrently with CLP 6445.
- CLP 6456 Individual Counseling--Theory and Practice*** 3 cr (2,2)
PR: Graduate admission and C.I. Introduction to Counseling Theory. Experiential Laboratory.
- CLP 6456L Clinical Lab: Counseling** 1 cr (0,2)
C.I. Practice in specific techniques in counseling. To be taken concurrently with CLP 6456.
- CLP 6457 Group Psychotherapy*** 3 cr (2,2)
PR: CLP 6456, Graduate admission and C.I. Group counseling: Theory and Process. Experiential Group Laboratory.
- CLP 6457L Clinical Lab: Group Therapy** 1 cr (0,2)
C.I. Practice in specific techniques in group therapy. To be taken concurrently with CLP 6457.
- CLP 6458 Behavior Therapy*** 3 cr (2,2)
PR: CLP 6456, CLP 6457, Graduate admission and C.I. Introduction to the principles and procedures of behavior modification as a clinical intervention technique.
- CLP 6458L Clinical Lab: Behavior Therapy** 1 cr (0,2)
C.I. Practice in specific techniques in behavior therapy. To be taken concurrently with CLP 6458.
- CLP 6459 Human Sexuality, Marriage, and Family Therapies.*** 3 cr (3,0)
PR: CLP 6456, CLP 6458, Graduate admission and C.I. Survey of human sexuality, theory and practice of crisis, family and couples therapy.
- CLP 6459L Clinical Lab: Marriage and Family Counseling** 1 cr (0,2)
C.I. Practice in specific techniques in marriage and family counseling. To be taken concurrently with CLP 6459.
- CLP 6932 Ethical and Professional Issues in Mental Health Practices.*** 3 cr (3,0)
PR: Graduate admission, C.I. Examination of codes of ethics, laws, and professional standards in the mental health field.
- CYP 6948 Psychology Internship** 3 cr (2,20)
PR: Graduate admission, second year status and C.I. Supervised placement in community setting for 8-20 hours per week. (May be repeated for credit.)
- DEP 5057 Developmental Psychology** 3 cr (2,2)
PR: Graduate admission or C.I. Psychological aspects of development including intellectual, social, and personality factors.
- EAB 5765 Applied Behavior Analysis with Children and Youth** 3 cr (3,0)
PR: DEP 5057 and EXP 5445 or C.I. Advanced survey of principles, procedures and techniques of applied behavior analysis, with special attention to applications with children and youth.
- EXP 5208 Sensation and Perception** 3 cr (3,0)
PR: C.I. A study involving the human information processing with regard to physical and psychological variables in sensory and perceptual phenomena.
- EXP 5255 Human Performance** 3 cr (3,0)
PR: C.I. Human performance dimensions and concepts of assessment of human capabilities; performance acquisition, information processing and decision making; applications of principles to understanding of stress and performance effectiveness.
- EXP 5256 Human Factors I** 3 cr (3,0)
PR: None. Survey of human factors literature. Introduction to topics including human capabilities and human interfaces with human-machine systems.
- EXP 5506 Human Cognition and Learning** 3 cr (3,0)
PR: EXP 3404 and EXP 3513. Research and theory relating to attention, memory, problem solving and reasoning.
- EXP 5608 Cognition** 3 cr (3,0)
PR: C.I. Pattern recognition, attention, short-term memory, long-term memory, visual imagery, categorization, language, problem solving.

- EXP 6257 Human Factors II** **3 cr (3,0)**
 PR: EXP 5256 (HF1). The second in the series of basic human factors courses involving an in-depth examination of issues.
- EXP 6258 Human Factors III** **3 cr (3,0)**
 PR: EXP 5256 (HF1). EXP 6257 (HF2). The third in the series of basic human factors courses. Current topics in human factors, exchange of information on practical field experience in human factors.
- EXP 6938 Teaching Seminar** **3 cr (3,0)**
 PR: C.I. Orientation to and supervision in teaching assigned courses.
- EXP 6946 Human Factors Internship** **8 cr (0,12)**
 PR: EXP 5256, EXP 6257, PSY 6216, PSY 6217, EXP 5255, INP 6330. Supervised placement in an industrial, governmental, or consulting setting. Student completes a specific project under the supervision of an organizational sponsor and a faculty member.
- INP 6215 Assessment Centers and Leadership** **3 cr (3,0)**
 PR: Graduate admission and C.I. Survey of assessment center technology and application with emphasis on leadership theory and practice.
- INP 6317 Organizational Psychology and Motivation** **3 cr (3,0)**
 PR: Graduate admission and C.I. Review of theories, research and application of psychological principles to organizational settings and human motivation.
- INP 6320 Training** **3 cr (3,0)**
 A review of theory and practice regarding needs analysis, design, implementation, and evaluation of training programs for business, industry and government.
- INP 6605 Training and Performance Appraisal** **3 cr (3,0)**
 PR: Graduate admission and C.I. Survey of theories, research and practice in the areas of industrial/organizational training and performance appraisal.
- INP 6939 Current Topics and Applied Problems in Industrial/Organizational Psychology** **3 cr (3,0)**
 PR: Graduate admission and C.I. Survey of current topics in Industrial/Organizational psychology with emphasis on applied problems.
- INP 6946 Industrial Psychology Practicum I** **3 cr (1,6)**
 PR: Graduate admission and C.I. Supervised placement in an applied setting.
- INP 6947 Industrial Psychology Practicum II** **3 cr (3,0)**
 PR: Graduate admission and C.I. Supervised research in industry. (May be repeated for credit.)
- PSB 5005 Physiological Psychology** **3 cr (3,0)**
 PR: PSB 3002 or C.I. An advanced survey of the physiological basis of behavior emphasizing the relationship between the nervous system and behavior.
- PSB 6446 Advanced Abnormal and Clinical Psychopharmacology** **3 cr (3,0)**
 PR: Graduate admission and C.I. Diagnosis of psychopathology and drug treatment of these disorders. Examination of the efficacy of psychoactive drugs.
- PSY 6216 Advanced Research Methodology I** **4 cr (3,2)**
 PR: Graduate admission and C.I. Logic and procedures of psychological research and evaluation; application of experimental and non-experimental techniques in analyzing psychological variables; review of relevant psychological research.
- PSY 6217 Advanced Research Methodology II** **4 cr (3,2)**
 PR: PSY 6216. Graduate admission and C.I. Structure and planning of complex psychological experiments; internal and external validity; application of advanced experimental procedures in analyzing psychological variables; review of relevant psychological research.
- PSY 6308 Psychological Testing I** **3 cr (3,0)**
 PR: Graduate admission and C.I. Theory of test construction including test reliability and validity.
- PSY 6318 Applied Testing and Selection** **3 cr (3,0)**
 PR: PSY 6308, Graduate admission and C.I. Issues in selecting employees and an examination of currently used tests in industry.

PSY 6908 Directed Independent Studies **3 cr (3,0)**
 PR: C.I. Conduction of a selected research study under the supervision of a faculty member in the field of Human Factors Psychology.

PSY 6918 Directed Research **3 cr (3,0)**
 PR: PSY 6217, EXP 6257, PSY 6938, ten additional graduate hours in PSY, and C.I. Directed Research involves supervised research activity in an agency setting. The student will devote 15 hours per week in the assigned setting to work on an applied research problem with joint supervision by faculty and agency staff.

PSY 6919 Research Report **3 cr (3,0)**
 PR: PSY 6918. Preparation of a written report of the project completed in PSY 6918. This report will be in the form of a research publication or technical report.

PSY 6938 Research Planning **1 cr (0,0)**

PSY 6909 Research Report **1-3 cr (0,0)**

PSY 6971 Thesis **1-8 cr (0,0)**

PSY 7919 Doctoral Research **6 cr (0,0)**

PSY 7980 Doctoral Dissertation **6 cr (0,0)**

*Must coregister for the appropriate section of lab.

SOCIOLOGY, APPLIED

Ida J. Cook Graduate Program Coordinator
 Office: FA 402, Phone (407) 823-2227

W. R. Brown, Ph.D. Professor
D. R. Dees, Ph.D. Associate Professor
D. A. Fabianic, Ph.D. Chair and Professor
D. A. Gay, Ph.D. Assistant Professor
J. P. Lynxwiler, Ph.D. Assistant Professor
C. M. Unkovic, Ph.D. Professor

CATALOG PROGRAM DESCRIPTION

In addition to the standard admission criteria to Graduate Studies, the Department requires complete transcript of past university/college work and three letters of reference including at least one from an academic source familiar with the applicant's abilities. The Graduate Record Examination (GRE) scores should be no more than seven years old.

The applicant's records will be reviewed on an individual basis for academic deficiencies. Supplemental course work may be recommended. Note also that there is no automatic connection between acceptance as a post-baccalaureate student and acceptance into this degree-granting program. Consult the Program *Director* whenever questions arise.

Program in Applied Sociology

The Department of Sociology and Anthropology offers a graduate program leading to the Master of Arts degree in Applied Sociology with an opportunity for concentrated studies in deviant behavior and community policy. A primary focus of the graduate program is to enhance the abilities of the students to apply a sociological perspective and specific analytical skills to research topics in the Central Florida area. Toward this objective, the program promotes the application of sociological and social psychological knowledge, principles, and research skills in a variety of organizational, community, and institutional settings. Beyond a curriculum appropriate for general applied sociology, the program offers instruction and opportunity pertaining to deviant behavior, social disorganization, and social problems.

Examples of competencies in applied sociology include effective skills in conceptualiza-

tion of human and organizational problems, communication skills, program design and evaluation, planning, feasibility and needs assessment studies, data management, analysis and presentation, the application of general systems theory and the social conflict perspective to organizational problems, community development and planned change.

Master of Arts Degree Requirements— Applied Sociology

Degree-seeking students in the Applied Sociology Program may elect to follow either a thesis or a non-thesis course of study. The degree of Master of Arts is conferred when students have fulfilled the requirements of either the Thesis or Non-thesis options. Both options require 30 hours of course work.

REQUIRED COURSES

			12 Semester Hours
SYA	5625	Proseminar	3 hours
SYA	6126	Social Theory	3 hours
SYA	6305	Social Research	3 hours
SYA	6455	Research Analysis	3 hours

ELECTIVES

12 Semester Hours

Students will select a minimum of 12 semester hours of (nonrestricted) electives in consultation with their faculty advisor. No more than 6 hours may be taken in UCF graduate programs outside the Department.

THESIS OPTION

6 Semester Hours

A minimum of six semester hours of thesis credit and a successful defense of a thesis is required. The thesis option is highly recommended for students interested in community college teaching and/or graduate work beyond the Master of Arts Degree.

NON-THESIS OPTION

6 Semester Hours

All of the Department's graduate courses are research oriented seminars; however, in lieu of the thesis, students must take two additional courses (6 hours) in a chosen area of specialization. Non-thesis students may substitute up to 6 hours of their elective course work by completing a graduate practicum/internship (SYA 6946). The practicum must be approved by the Advisory Committee.

EXAMINATION REQUIREMENTS

Thesis Option:

1-8 Semester Hours

Mandatory requirements include the successful completion of a two-part written comprehensive examination and a final oral defense of thesis.

Non-Thesis Option:

Mandatory requirements include the successful completion of a two-part comprehensive written examination and an additional specialty examination in the selected area of specialization.

Total Minimum Semester Hours Required:

30

Applied Sociology Courses

ANT 5479 Comparative Cultural Analysis

3 cr (3,0)

The dynamics of cultural processes in a multi-ethnic setting.

SYA 5625 ProSeminar.

Survey of conceptual issues, methodological concerns, and findings in substantive sociological areas that currently dominate scholarly inquiry, including such topics as crime, deviance, community, alcoholism, education.

SYA 6126 Social Theory

3 cr (3,0)

PR: C.I. The study of selected sociological theories in terms of relevance, usefulness, and adequacy for applied sociology.

SYA 6305 Social Research**3 cr (3,0)**

PR: C.I. Research methodology including problem conceptualization, sampling designs, research proposals, data collection and evaluation techniques for applied settings.

SYA 6455 Research Analysis**3 cr (2,2)**

PR: SYA 6305. Undergraduate statistics, or C.I. Data management, selection of statistics, data analysis, evaluation, data presentation, and computer skills.

SYA 6656 Social Organization and Human Resources**3 cr (3,0)**

PR: C.I. Complex organization theory, social systems analysis, competence in group dynamic skills and use of human resources in agencies, businesses, and industries.

SYA 6657 Program Design and Evaluation**3 cr (3,0)**

PR: C.I. Techniques of system and policy assessment, evaluation and design. Determination of consequences and implications of policies and practices in applied settings.

SYA 6971 Thesis**1-8 cr (0,0)****SYO 6515 Issues in Social Disorganization****3 cr (3,0)**

PR: C.I. Sociological study and analysis of the manner in which American society is organized and the consequences of the way in which its cultural premises are arranged.

SYP 6045 Clinical Sociology**3 cr (3,0)**

PR: C.I. The use of applied strategies which employ sociological diagnosis and treatment of community groups and their members.

SYP 6515 Deviant Behavior Issues**3 cr (3,0)**

PR: C.I. An examination and evaluation of the forms of social deviance, and the organizations designed to respond to them.



STATISTICAL COMPUTING

James R. Schott Graduate Program Coordinator
Office: CC II 226, Phone (407) 823-2797

M. E. Johnson, Ph.D. Professor and Chair
G. D. Richardson, Ph.D. Professor
P. N. Somerville, Ph.D. Professor
L. C. Malone, Ph.D. Associate Professor
J. R. Schott, Ph.D. Associate Professor
L. L. Hoffman, Ph.D. Assistant Professor
M. K. Kazempour, Ph.D. Assistant Professor
D. Nickerson, Ph.D. Assistant Professor
D. Kim, Ph.D. Visiting Assistant Professor

Admission

Admission requirements are the standard University criteria of a 3.0 grade point average (GPA) for the last 60 semester hours of credit earned towards the baccalaureate or a Graduate Record Examination (GRE) score of at least 1000 for the combined verbal-quantitative sections of the General (Aptitude) Test. The GRE must be less than 5 years old. To be admitted to the M.S. program in Statistical Computing with regular graduate status, it is desirable that the student should have completed the following courses or their equivalents: COT 4500, COP 2001, MAC 3313, MAS 3113 (or MAS 3103), STA 4164, STA 4322. Those students who find they are not adequately prepared in these areas may select appropriate courses from the undergraduate curriculum to make up such deficiencies. The student must have completed COT 4500 and STA 4322, or their equivalents, before the M.S. degree will be granted (STA 6354 may be substituted for STA 4322). Applicants not qualified for regular status may be initially admitted to the University in a post-baccalaureate status.

Program in Statistical Computing

The Master of Science degree program in Statistical Computing is an innovative program with emphasis on the use, adaptation or development of statistical methods using state-of-the-art computer technology in the analysis of data from problems in all fields of study.

The program provides a sound foundation in statistical theory, statistical methods, numerical methods in statistical computing, and in the application of computer methodology to statistical analyses.

The program is particularly well-suited for those individuals who have completed an undergraduate program in mathematics, statistics, or computer science, but is also available to persons in other disciplines who wish to develop an expertise in data analysis and statistical computing.

Most graduate courses are offered during the evening hours in order to accommodate part-time and working students.

Master of Science Degree Requirements— Statistical Computing

The Statistical Computing degree requires a total of 30 credit hours, with a minimum of 24 hours of graduate-level course work.

REQUIRED COURSES

			12 Semester Hours
STA	6106	Statistical Computing	3 hours
STA	6236	Regression Analysis	3 hours
STA	6246	Linear Models	3 hours
MAS	5115	Matrix Theory and Its Applications	3 hours

ELECTIVES

15-19 Semester Hours

Other courses will be selected by the student in consultation with the advisor, subject to

the approval of the student's graduate committee. These courses will ordinarily be tailored to meet the objectives of the student. For example, those students planning further graduate work might include MAA 5211, Advanced Multivariable Calculus; STA 6354, Theory of Statistics; and STA 6447, Applied Probability. A student with strong interests in Computer Science might include COT 5510, Computational Methods/Linear Systems, and COT 6505, Computational Methods/Analysis I.

THESIS OR RESEARCH REPORT

2-6 Semester Hours

Ordinarily a report which is of sufficient magnitude to justify awarding more than 4 hours of credit is considered a thesis. Otherwise it is a research report.

An oral defense of the report will be required of all students.

EXAMINATION REQUIREMENTS

A final written examination is required of all students.

Total Minimum Semester Hours Required:

30

Statistics Courses

STA 5156 Probability and Statistics for Engineers

3 cr (3,0)

PR: STA 3032 or equivalent. Theory and applications of discrete and continuous random variables, hypothesis tests, confidence intervals, regression analysis and correlation.

STA 5205 Experimental Design and Response Surface Methodology

3 cr (3,0)

PR: STA 4164 or STA 5206. Construction and analysis of designs for experimental investigations. Concepts of blocking, randomization, and replication. Confounding in factorial experiments, incomplete block designs. Response surface methodology.



STA 5206 Statistical Analysis**3 cr (3,0)**

PR: STA 3023; not open to students who have completed STA 4164. Data analysis; statistical models; estimation; tests of hypotheses; analysis of variance, covariance and multiple comparisons; regression and nonparametric methods.

STA 5505 Categorical Data Methods**3 cr (3,0)**

PR: STA 4163 or STA 5206. Considers discrete probability distributions, contingency tables, measures of association and advanced methods including loglinear modeling, logistic regression, McNemar's Test, Mantel-Haenszel tests.

STA 5825 Stochastic Processes and Applied Probability Theory**3 cr (3,0)**

PR: STA 4321. Conditional probability and conditional expectations, sequences of random variables, branching processes, random walks, Markov chains, recurrent events, renewal theory, queueing theory, and simple stochastic processes.

STA 6106 Statistical Computing**3 cr (3,0)**

PR: Knowledge of a programming language, STA 4164. Percentage point algorithms, methods for distributions; random variate generation; computational methods for regression analysis; bootstrap, jackknife, sample re-use, cross-validation; software development for statistical problems.

STA 6226 Sampling Theory and Applications**3 cr (3,0)**

PR: STA 4321. Different techniques of sampling, sampling for proportions, choosing sample size, ratio estimates, effects of sampling and non-sampling errors.

STA 6236 Regression Analysis**3 cr (3,0)**

PR: MAS 3113 and STA 4164. General linear model, model aptness and remedial measures, regression through the origin, independent and dependent indicator variables, multicollinearity, outliers, biased regression.

STA 6507 Nonparametric Statistics**3 cr (3,0)**

PR: At least one course in statistics. Theory and methods for one and two sample problems; one and two way layouts; independence problems; regression problems.

1942-1943
 The first year of the war was a time of great hardship for the people of the United States. The economy was in a state of depression, and the government was struggling to raise money to fight the war. The people were living in poverty, and the government was trying to help them by providing food and clothing. The war was a time of great sacrifice for the people of the United States.

1944-1945
 The second year of the war was a time of great hardship for the people of the United States. The economy was in a state of depression, and the government was struggling to raise money to fight the war. The people were living in poverty, and the government was trying to help them by providing food and clothing. The war was a time of great sacrifice for the people of the United States.

1946-1947
 The third year of the war was a time of great hardship for the people of the United States. The economy was in a state of depression, and the government was struggling to raise money to fight the war. The people were living in poverty, and the government was trying to help them by providing food and clothing. The war was a time of great sacrifice for the people of the United States.

1948-1949
 The fourth year of the war was a time of great hardship for the people of the United States. The economy was in a state of depression, and the government was struggling to raise money to fight the war. The people were living in poverty, and the government was trying to help them by providing food and clothing. The war was a time of great sacrifice for the people of the United States.

1950-1951
 The fifth year of the war was a time of great hardship for the people of the United States. The economy was in a state of depression, and the government was struggling to raise money to fight the war. The people were living in poverty, and the government was trying to help them by providing food and clothing. The war was a time of great sacrifice for the people of the United States.

1952-1953
 The sixth year of the war was a time of great hardship for the people of the United States. The economy was in a state of depression, and the government was struggling to raise money to fight the war. The people were living in poverty, and the government was trying to help them by providing food and clothing. The war was a time of great sacrifice for the people of the United States.

1954-1955
 The seventh year of the war was a time of great hardship for the people of the United States. The economy was in a state of depression, and the government was struggling to raise money to fight the war. The people were living in poverty, and the government was trying to help them by providing food and clothing. The war was a time of great sacrifice for the people of the United States.

COLLEGE OF BUSINESS ADMINISTRATION

The College of Business Administration offers four professional programs leading to the master's degree: Master of Business Administration, Master of Science in Accounting, Master of Science in Taxation, and Master of Arts in Applied Economics. Also offered is a Doctor of Philosophy Degree (Ph.D.) in Business Administration with majors in Accounting and Finance. The Master of Business Administration program is also conveniently available to Brevard County and Daytona residents. Some courses are offered at UCF's Brevard Campus in Cocoa and others are taught by UCF College of Business faculty on the Melbourne Campus of Brevard Community College. Classes in Daytona are taught at the UCF Building on the campus of Daytona Beach Community College. All graduate programs in business are accredited by the American Assembly of Collegiate Schools of Business (AACSB).

The mission of the College of Business Administration at the University of Central Florida is to provide quality business education programs, at the undergraduate, graduate, and executive levels, to the citizens of the state of Florida and to selected clientele nationally and internationally. In delivering these programs, the College places primary emphasis on excellent teaching and research with a strong commitment to developing mutually supportive relationships with the business community of Central Florida.

In pursuit of its mission, the College of Business Administration affirms its commitment to the University's focus on excellence and accent on the individual. Furthermore, the College pledges to deliver innovative and progressive programs to its clientele. As the College approaches the twenty-first century, it has adopted "Driven by Excellence" as a motto and guiding force in achieving its goals and objectives.

COLLEGE ADMINISTRATION

R. C. Huseman Dean
J. D. Hatfield Associate Dean
H.S. Lewis Associate Dean

L. B. Putchinski Graduate Program Coordinator
Office: BA 241, Phone (407) 823-2186

L.P. Jarvis Brevard Campus Coordinator
Phone (407) 632-0098

J. H. Potts Phone (904) 254-4412, ext. 4019Daytona Campus Coordinator

Faculty

School of Accounting
T. G. Evans, Ph.D. Director and Professor
H.R. Anderson, Ph.D. Professor
C. G. Avery, Ph.D. Professor
D.D. Bandy, Ph.D. Knights' Professor of Taxation
J. H. Potts, Ph.D. Professor
W.L. Johnson, Ph.D. Associate Professor
T.E. Phillips, Ph.D. Associate Professor
J.H. Salter III, Ph.D. Associate Professor
L.J. Savage, Ph.D. Associate Professor
P.R. Welch, Ph.D. Associate Professor
P.M. Goldwater, Ph.D. Assistant Professor
A.J. Judd, Ph.D. Assistant Professor
C. F. Kelliher, Ph.D. Assistant Professor
N. Klintworth, J.D. Assistant Professor
R.M. Landry, Ph.D. Assistant Professor

L.G. Levy, J.D.	Assistant Professor
P.B. Roush, Ph.D.	Assistant Professor
J.K. Welch, Ph.D.	Assistant Professor

Economics

F.A. Raffa, Ph.D.	Professor
B. Rungeling, Ph.D.	Professor
A.E. Day, Ph.D.	Associate Professor
R.A. Hoffer, Ph.D.	Associate Professor
D.A. Hosni, Ph.D.	Associate Professor
W.W. McHone, Ph.D.	Chair and Associate Professor
T.L. Martin, Ph.D.	Associate Professor
R.L. Pennington, Ph.D.	Director and Associate Professor
K.R. White, Ph.D.	Associate Professor
J.A. Xander, Ph.D.	Associate Professor
B.M. Braun Ph.D.	Assistant Professor
W.E. Gibbs, Ph.D.	Assistant Professor
W.R. Kilbride, Ed.D.	Assistant Professor
M. Soskin, Ph.D.	Assistant Professor

Finance

D.R. Klock, Ph.D.	Professor
H.S. Lewis, Ph.D.	Associate Dean and Professor
C.D. McQuillen, Ph.D.	Professor
W.W. Reiff, D.B.A.	Professor
D.F. Scott, Jr., Ph.D.	Chair in American Private Enterprise and Professor
S.M. Atkinson, D.B.A.	Associate Professor
J.M. Cheney, Ph.D.	Associate Professor
R.J. Clayton, Ph.D.	Chair and Associate Professor
S.S. Graham, Ph.D.	Associate Professor
N.K. Modani, Ph.D.	Associate Professor
W.C. Weaver, Ph.D.	Associate Professor
L.P. Hseuh, Ph.D.	Assistant Professor
Y.A. Liu, Ph.D.	Assistant Professor
A.D. Neustel, Ph.D.	Assistant Professor
H. Park, Ph.D.	Assistant Professor
R.E. Spudeck, Ph.D.	Assistant Professor

Management

W. Berry, Ph.D.	Professor
C.L. Eubanks, Ph.D.	Professor
H.R. Jones, Ph.D.	Chair and Professor
W.A. Bogumil, Jr., Ph.D.	Associate Professor
W.G. Callarman, D.B.A.	Associate Professor
P.M. Fandt, Ph.D.	Associate Professor
L.W. Fernald, Jr., D.B.A.	Associate Professor
S. Goodman, Ph.D.	Associate Professor
W. Leigh, Jr., Ph.D.	Associate Professor
R.L. Martin, Ph.D.	Associate Professor
W.W. McCartney, Ph.D.	Associate Professor
J.M. Ragusa	Associate Professor
S.A. Rozenkrantz	Associate Professor
P.S. Lewis, Ph.D.	Assistant Professor

Marketing

P.L. Gillett, Ph.D.	Professor
G.W. Paul, Ph.D.	Professor
R.S. Rubin, Ph.D.	Professor
E.E. Teeple, Ph.D.	Professor
D.L. Davis, D.B.A.	Acting Chair and Associate Professor

<i>R. Fisk, Ph.D.</i>	Associate Professor
<i>D.A. Fuller, Ph.D.</i>	Associate Professor
<i>L.P. Jarvis, Ph.D.</i>	Associate Professor
<i>M.H. Morris, Ph.D.</i>	Assistant Professor
<i>C. Patton, Ph.D.</i>	Assistant Professor

ADMISSION TO MASTER'S PROGRAMS

Before candidates will be considered for admission, all required application documents including application, official transcripts, and GMAT test score (or GRE test score for the program in Applied Economics only) must be received in the College of Business Graduate Office by:

Fall semester admission	— June 15
Spring semester admission	— November 1
Summer semester admission	— March 15

Admission to graduate study in the College of Business Administration is open to individuals with a baccalaureate degree in any discipline from a regionally accredited college or university. No previous training in business or economics is required as a prerequisite for graduate status. Thus, all graduate programs are open to graduates in education, engineering, arts, sciences, and other fields as well as business.

Admissions are restricted each semester to an allotted number of individuals showing high promise of success in post-graduate studies. Admission criteria include academic achievement as an upper-division undergraduate student and performance on the Graduate Management Admissions Test (GMAT). For the M.A. in Applied Economics degree only, scores on either the Graduate Record Exam (GRE) or GMAT may be submitted. The College of Business normally requires a minimum GMAT score of 500. The GRE score must be at least 1000 for the M.A. in Applied Economics. Both GMAT and GRE scores have a limit of 5 years.

The average grade point average for students entering the graduate business programs during the most recent academic year was 3.1. The average GMAT score for the same group was at the 63rd percentile. Other indicators of promise may include the applicant's extracurricular activities, work experience and job responsibilities, and leadership experience.

Foreign students whose native language is not English are required to achieve a score of at least 575 on the Test of English as a Foreign Language (TOEFL) for further consideration.

Enrollment in graduate courses in the College of Business Administration is limited to students who have been accepted and classified with regular graduate status in the M.B.A. program, M.S. in Accounting, M.S. in Taxation, or the M.A. in Applied Economics, and to



other students with regular graduate status elsewhere in the University. Graduate level courses may not be taken unless a student is accepted into a graduate program, i.e., graduate courses may not be taken in a post-baccalaureate status.

An applicant will not be considered for admission to any graduate course until a score on the GMAT or GRE (and TOEFL, if appropriate) has been received, in addition to transcripts showing proof of attainment of the bachelor's degree and transcripts from all colleges attended.

ACADEMIC STANDARDS

Graduate students in the College of Business Administration must maintain an overall 3.0 GPA in both their program of study and any graduate or undergraduate foundation core courses. In the event this is not maintained, a graduate student shall be placed in an academic provisional status. If a 3.0 GPA (grades of "B" or better) is then not obtained in the subsequent 9 semester hours of course work, the graduate student will be disqualified from the program. Further, if a graduate student accumulates grades of "C" or lower or unresolved "I" grades in more than three (3) foundation core courses, he will be disqualified from the program. If a graduate student accumulates more than six (6) hours of "C" or lower and/or unresolved "I" grades on course work in the professional core, then he will be disqualified from the graduate program. The forgiveness policy does not apply to any courses (graduate or undergraduate) taken by graduate students in the College of Business Administration. Students in all graduate programs must achieve a minimum grade of "C" in all foundation and professional core courses.

MASTER'S PROGRAMS

MASTER OF BUSINESS ADMINISTRATION

Program Advisor: *L. B. Putchinski BA 241, Phone (407) UCF-2186*

Brevard Campus Advisor: *L. P. Jarvis, Phone (407) 632-0098*

Daytona Campus Advisor: *J. H. Potts, Phone (904) 254-4412*

The program leading to the Master of Business Administration degree at the University of Central Florida is designed to develop the student's analytical, problem-solving, and decision-making capabilities to meet the challenges of leadership in professional management positions at present and in the changing world of the future.

The curriculum provides a challenging and creative learning environment in an intensive program of study that has a broad-based administrative emphasis. Recognizing that management methods of tomorrow may bear little resemblance to techniques in current use, the program emphasis is on sound general principles and decision-making techniques that provide a base for continued learning and professional development rather than upon business procedures which are subject to obsolescence.

The program can be completed on either a full-time or part-time basis on the Orlando Campus. For Brevard County residents the program is available on a part-time basis in the evening with some coursework offered on UCF's Brevard Campus in Cocoa and some coursework taught by College of Business Administration faculty at Brevard Community College's Melbourne Campus. The program is also offered on a part-time basis, evenings, at the UCF Building on the Daytona Beach Community College campus.

Master of Business Administration— Degree Requirements

Normally, the M.B.A. program can be completed in two years of full-time study. Recent related course work in business administration and certain quantitative areas, however, can reduce the length of the program to one calendar year of full-time study. The curriculum consists of two parts, a foundation core and a professional core.

The foundation core is defined by the course requirements listed below, and its completion is a prerequisite to entering the professional core. Note that all or part of the foundation core requirements may be satisfied through advanced standing given in view of a student's prior equivalent course work at the undergraduate or graduate level provided such course

work has been satisfactorily completed at a regionally accredited college or university, preferably one accredited by the AACSB.

FOUNDATION CORE			33 Semester Hours
ACG	5005	Financial Accounting Concepts	3 hours
BUL	5125	Legal and Social Environment of Business	3 hours
ECO	5005	Economic Concepts	3 hours
ECO	5415	Statistics for Business and Economics	3 hours
FIN	5405	Financial Concepts	3 hours
MAC	1104	College Algebra	3 hours
MAC	3233	Concepts of Calculus	3 hours
MAN	5051	Management Concepts	3 hours
MAN	5501	Introduction to Production/Operations Management	3 hours
ISM	5021	Introduction to Management Information Systems	3 hours
MAR	5055	Marketing Concepts	3 hours

The professional core consists of 24 credit hours of advanced course work that substantially extends and applies knowledge developed in the foundation core. Through the selection of nine credit hours of approved electives, the student has the opportunity to develop some degree of specialization in one of the following: accounting, economics, finance, management, or marketing.

PROFESSIONAL CORE			24 Semester Hours
ACG	6425	Managerial Accounting Analysis	3 hours
ECO	6115	Economic Analysis of the Firm	3 hours
ECO	6416	Statistical Methods for Business Decisions	3 hours
FIN	6406	Financial Analysis and Management	3 hours
MAN	6206	Organizational Behavior and Development	3 hours
MAN	6721	Business Policy and Responsibility	3 hours
MAN	6814	Quantitative Models for Business Decisions	3 hours
MAR	6816	Marketing Policy	3 hours

M.B.A. with Specialization in Marketing

Students seeking a M.B.A. degree with a specialization in marketing should enroll in the M.B.A. Program. A specialization in Marketing requires a minimum of 9 hours of graduate electives, in addition to MAR 6816. Students may take their 9 hours of elective courses in marketing from the following courses:

MAR	6406	Sales Management
MAR	6456	Industrial Marketing
MAR	6616	Marketing Research
MAR	6666	Marketing Models
MAR	6706	Contemporary Marketing Problems
MAR	6845	Services Marketing

Marketing undergraduate majors are not allowed to take MAR 6816. Instead, they must replace the course with one of the marketing electives outlined above.

ELECTIVES 9 Semester Hours

Electives may be taken in accounting, economics, finance, marketing, management, or information systems management. An elective course may be taken outside the College of Business Administration with permission of the program coordinator. The M.B.A. program does not require a thesis. Students may not take more than 9 semester hours in accounting electives.

EXAMINATION

The end-of-program requirement for the Master of Business Administration degree will include the following:

1. Students completing the program in three (3) consecutive years (no interruptions) or less will complete the capstone, integrative course MAN 6721, Business Policy and Responsibility, with a grade of "B" or better.
2. Students requiring more than three (3) years to complete the professional core must pass a comprehensive, integrative examination consisting of four (4) equal parts covering the areas of economics, finance, management and marketing. Each part of the test must be passed. If any part of the examination is failed on the initial attempt, the student will prepare a plan of study in cooperation with the Department Chair and Director of the M.B.A. program in order to be eligible to retake that part in the following term.

Total Minimum Semester Hours Required:

33-63

MASTER OF SCIENCE IN ACCOUNTING

Program Advisor: L. J. Savage, BA 433, Phone (407) UCF-5667

The Master of Science in Accounting degree provides candidates with greater breadth and depth in accounting than is possible in baccalaureate programs. The program emphasis is on the preparation of individuals for careers as professional accountants in public practice, financial institutions, governments, industry, and nonprofit organizations. (This program satisfies the requirements of the State Board of Accounting Rule 21-A-27.02.)

The Master of Science in Accounting degree is awarded upon satisfactory completion of a graduate program of 30 semester hours. At least 15 of the 30 hours must be made up of 6000 level courses. Students, with the assistance and approval of the program advisor, may select an area of specialization in Management, Public, Tax, General, or Not-for-Profit Accounting. Following is a list of required courses and restricted electives.

Master of Science in Accounting— Degree Requirements

REQUIRED COURSES			30 Semester Hours
			15 Semester Hours
ACG	5346	Cost Accounting II	3 hours
TAX	5015	Federal Income Tax II	3 hours
ACG	5636	Advanced Auditing	3 hours
ACG	6405	Accounting Information Systems II	3 hours
ACG	6805	Seminar in Accounting Theory	3 hours
RESTRICTED ELECTIVE COURSES			15 Semester Hours
Electives from the categories below must be selected with advisor approval.			
Two courses from the following:			
ACG	6356	Seminar in Cost Accounting	3 hours
ACG	6696	Seminar in Auditing	3 hours
ACG	6806	Seminar in Professional Accounting Issues	3 hours
ACG	6895	Professional Accounting Practice	3 hours
ACG	6697	Seminar in Auditing for Governmental and Nonprofit Organizations	3 hours
TAX	6065	Seminar in Tax Research	3 hours
TAX	6135	Seminar in the Taxation of Corporations and Shareholders	3 hours
TAX	6205	Seminar in Taxation of Partnership Income	3 hours
TAX	6405	Seminar in the Taxation of Estates, Gifts and Trusts	3 hours
TAX	6845	Seminar in Tax Planning	3 hours
Two courses from the following:			
ECO	6115	Economic Analysis of the Firm	3 hours
ECO	6416	Statistical Methods for Business Decisions	3 hours
FIN	6406	Financial Analysis and Management	3 hours
MAN	6206	Organizational Behavior and Development	3 hours

MAN	6814	Quantitative Models for Business Decisions	3 hours
MAR	6816	Marketing Policy	3 hours
One additional course from Restricted Electives above or one of the following:			
ACG	5206	Financial Accounting V	3 hours
ACG	5255	International and Multinational Accounting	3 hours
ACG	5435	Accounting Control Systems	3 hours
ACG	5506	Managerial Accounting for Governmental and Nonprofit Organizations	3 hours
ACG	5625	Auditing and EDP	3 hours
ACG	5675	Operational Auditing	3 hours
ACG	6946	Internship	3 hours

FOUNDATION CORE

60 Semester Hours

The courses in the foundation core for this program are usually satisfied if a person enters the M.S.A. program with an undergraduate degree in accounting. Such course work must have been satisfactorily completed at a regionally accredited college or university, preferably one accredited by the AACSB. The accounting undergraduate program at UCF meets these requirements. However, if deficiencies exist, they must be satisfied before advanced course work can be taken. Some of the prerequisite course work may be satisfied through credit by examination if approved by the school.

ACG	3103	Financial Accounting I	3 hours
ACG	3113	Financial Accounting II	3 hours
ACG	3361	Cost Accounting I	3 hours
ACG	4401	Accounting Information Systems I	3 hours
ACG	3501	Financial Accounting for Governmental and Nonprofit Organizations	3 hours
ACG	4123	Financial Accounting III	3 hours
ACG	4203	Financial Accounting IV	3 hours
TAX	4001	Federal Income Tax I	3 hours
ACG	4651	Auditing	3 hours
BUL	3112	Business Law I	3 hours
BUL	3121	Business Law II	3 hours
ECO	5005*	Economic Concepts	3 hours
ECO	5415*	Statistics for Business and Economics	3 hours
FIN	5405*	Financial Concepts	3 hours
MAC	3233	Concepts of Calculus	3 hours
MAN	4720	Business Policy	3 hours
MAN	5051*	Management Concepts	3 hours
MAN	5501*	Introduction to Production/Operations Management	3 hours
ISM	5021*	Introduction to Management Information Systems	3 hours
MAR	5055*	Marketing Concepts	3 hours

*Or undergraduate course equivalent taken as an undergraduate student.

Student must show clear evidence of proficiency in oral and written communication.

EXAMINATION

Satisfactory completion of an end-of-program comprehensive examination is required. The M.S. in Accounting program does not require a thesis.

MASTER OF SCIENCE IN TAXATION

Program Advisor: Dale Bandy, BA 435, Phone (407) UCF-2964 or UCF-2463

The Master of Science in Taxation degree program provides candidates with an opportunity to specialize in taxation. The program emphasis is on the preparation of individuals for careers as professional accountants in public practice, government, and industry. (This program satisfies the requirements of the State Board of Accounting to qualify for the CPA examination if a candidate holding the appropriate undergraduate degree in accounting takes ACG 5636, Advanced Auditing, as an elective in the M.S.T. program.) The Master of

Science in Taxation degree is awarded upon completion of a graduate program with a minimum of 30 semester hours. The program consists of 18 hours of required graduate tax courses and 12 hours of restricted electives. Electives are selected with the assistance and approval of the advisor. Required courses and available electives are described below.

Master of Science in Taxation— Degree Requirements

REQUIRED COURSES

18 Semester Hours

TAX	5015	Federal Income Tax II	3 hours
TAX	6065	Seminar in Tax Research	3 hours
TAX	6135	Seminar in the Taxation of Corporations and Shareholders	3 hours
TAX	6205	Seminar in Taxation of Partnership Income	3 hours
TAX	6405	Seminar in Taxation of Estates, Gifts, and Trusts	3 hours
TAX	6845	Seminar in Tax Planning	3 hours

RESTRICTED ELECTIVE COURSES

12 Semester Hours

A total of 12 semester hours of electives must be selected with advisor approval. Master of Science in Taxation electives may be selected from either the required courses or any category of elective courses available in the Master of Science in Accounting degree program (other than the 18 semester hours of tax courses listed above).

FOUNDATION CORE

60 Semester Hours

The courses in the foundation core for this program are satisfied if a person enters the M.S.T. program with a recent undergraduate degree in accounting from an AACSB accredited college or university. The accounting undergraduate program at UCF meets this requirement. Students with non-accounting undergraduate degrees or degrees from unaccredited institutions must complete the 60 semester hour foundation core. Credit is given for previously completed work. The courses included in the foundation core are listed in the Master of Science in Accounting degree requirements.

EXAMINATION

Satisfactory completion of the end-of-program comprehensive examination is required.

Master of Arts in Applied Economics

Program Advisor: *R. L. Pennington, BA 325, Phone (407) UCF-2870*

The Master of Arts in Applied Economics degree is a one-year (full-time) or two-year (part-time) program designed to provide specialization in economics for persons desiring careers as economists in the academic, governmental, business, and financial communities. Contemporary society offers almost unlimited opportunities to individuals with an understanding of economic relationships and the tools of analysis to understand today's economic problems. Economists work on such problems as sales forecasting, market analysis, economic feasibility, hedging and commodity pricing, unemployment, inflation, balance of payments, energy development, pollution abatement, and many other current problems.

Master of Arts in Applied Economics— Degree Requirements

The Master of Arts in Applied Economics degree requires 30 semester hours presuming that all of the prerequisites have been completed prior to admission.

PREREQUISITES

12 Semester Hours

The following prerequisites (or equivalents) should be completed before enrolling in 6000-level graduate courses:

ECO	5005	Economic Concepts	3 hours
ECO	5415	Statistics for Business and Economics	3 hours
MAC	1104	College Algebra	3 hours
MAC	3233	Concepts of Calculus	3 hours

Prerequisite work may be entirely or partially satisfied through prior equivalent course work. Normally, such course work must have been satisfactorily completed at a regionally accredited college or university, preferably one accredited by the AACSB. Prerequisite course work does not count toward the 30 semester hours credit required for completion of the M.A. in Applied Economics degree.

REQUIRED COURSES

9 Semester Hours

ECO	6115	Economic Analysis of the Firm	3 hours
ECO	6206	Aggregate Economic Conditions and Analysis	3 hours
ECO	6416	Statistical Methods for Business Decisions	3 hours

ECONOMICS ELECTIVES

12-21 Semester Hours

A minimum of twelve additional hours of economics elective course work is required.

NON-ECONOMICS ELECTIVES

0-9 Semester Hours

A maximum of nine hours of approved non-economics elective course work may be completed in disciplines such as accounting, finance, management, marketing, mathematics, statistics, public administration, and computer science. Career-oriented elective course work tracks are presented in later material.

THESIS OR INTERNSHIP

6 Semester Hours

Six credit hours of thesis or internship may be used to complete the M.A. in Applied Economics degree. The candidate may fulfill this requirement by completing: (1) a formal thesis on a topic selected in consultation with the candidate's advisory committee and meeting both departmental and university requirements or (2) an internship consisting of work in a business or governmental agency and an end-of-project report.

FINAL EXAMINATION

Candidates must satisfactorily complete a comprehensive final examination. If the thesis or internship option is chosen to complete the degree, the examination will normally consist of an oral examination over the thesis or internship project. The candidate's supervisory committee will have discretion to determine the extent of this requirement. Candidates choosing the non-thesis option will be required to pass a written examination covering economic theory and the candidate's career track.

Total Minimum Semester Hours Required:

30

CAREER-ORIENTED ELECTIVE TRACKS

Candidates for the Master of Arts in Applied Economics degree are encouraged to use the flexibility provided in the elective portion of the program to design a plan of study that enhances their particular career interests. The five suggested career-oriented elective tracks that follow are representative of some of the possibilities.

1. Financial Economics

For candidates seeking careers as financial economists in the fields of banking, brokerage, corporate or personal finance, selection among the following electives is recommended:

ECO	6266	Business Cycles and Forecasting
ECO	6226	Seminar in Money, Banking and Monetary Policy
ECP	6705	Managerial Economics
FIN	6406	Financial Analysis and Management
FIN	6425	Asset Management and Financial Decisions
FIN	6506	Analysis of Investment Opportunities
FIN	6627	International Financial Management
RMI	6008	Risk Management

2. Public Sector Economics

For candidates seeking careers in the public sector as planners, policy analysts, or regulators, selection among the following electives is recommended:

ECO	6226	Seminar in Money, Banking and Monetary Policy
ECO	6505	Public Finance and Fiscal Policy
ECP	6205	Labor Economics
ECP	6405	Industrial Organization and Performance
ECP	6426	Economics of Regulated Industries
ECP	6605	Economics of Urban and Regional Problems
ECP	6705	Managerial Economics
REE	6306	Corporate Real Estate Investment Decision-Making
Approved electives in Public Administration		
Approved electives in Political Science		
Approved electives in Political Theory		

3. Quantitative Economics

For candidates seeking careers as analysts, consultants, or researchers in business, government, or nonprofit institutions, selection among the following quantitative electives is recommended:

ECO	6266	Business Cycles and Forecasting
ECO	6424	Econometrics
ECP	6705	Managerial Economics
MAN	6814	Quantitative Models for Business Decisions
MAR	6616	Marketing Research Methods

4. International Political Economy

For candidates seeking positions with international organizations (such as the World Bank or United Nations), or overseas business or government appointments, selection among the following electives is recommended:

ECO	6705	Seminar in International Economics
ECS	6015	Economic Development
FIN	6627	International Financial Management
INR	6007	Seminar in International Politics
PUP	6058	Issues in International Public Policy

5. Human Resource Economics

For candidates seeking careers in the area of human resources development or positions in interdisciplinary manpower related issues, selection among the following electives is recommended:

ECP	6205	Labor Economics
ECS	6015	Economic Development
EIN	5117	Management Information Systems
EIN	6258	Man-Computer Interaction
EVT	6267	Vocational Program Planning, Development and Evaluation
ISM	6121	Systems Analysis and Development
MAN	6156	Personnel Resources Administration
MAN	6206	Organizational Behavior and Development
PAD	6417	Human Resource Management

Doctoral Program

Doctor of Philosophy Degree—Ph.D.

J. D. Hatfield	Program Director
Office: BA 230, Phone (407) UCF-5094	
P.R. Welch	Accounting Coordinator
Office: BA 429, Phone (407) UCF-2958	
D. R. Klock	Finance Coordinator
Office: BA 427, Phone (407) UCF-2662	

The objective of the doctoral program in business administration is to prepare students for academic careers in higher education in accounting and finance and management careers in profit and non-profit organizations. Success in the program is judged by the student's understanding of the issues and methodologies essential to the advancement of knowledge. Doctoral work is based on the achievement of academic and research competencies, rather than a specific number of courses. A student who participates in a doctoral program of study is expected to strive for the knowledge and skills necessary to develop excellence in teaching and to conduct quality research, and should at all times maintain the highest ideals of academic integrity and scholarship.

ADMISSION

Students applying for admission to the doctoral program in Business Administration will be required to submit recent scores on the Graduate Management Admission Test (GMAT). In order to be considered for admission to the program, students should have a grade point average of at least 3.25 (4.0 = A) on the last 60 hours of undergraduate work. Students already holding an M.B.A. degree or its equivalent should have, in addition, a GPA of 3.25 on all graduate work. The international student must submit the Test of English as a Foreign Language (TOEFL) score if the student is not a graduate from an accredited college or university in the United States. Each international student must also submit a minimum score of 240 on the Test of Spoken English (TSE). In special cases, students will be admitted to the Ph.D. program with a bachelor's degree. Admission decisions are made on the recommendation of the faculty of the appropriate department or school.

Before candidates will be considered for admission, all required application documents including application, official transcripts, and GMAT test scores must be received in the College of Business Graduate Office by March 1.

DEGREE REQUIREMENTS

Upon admission to the doctoral program, the student shall be assigned an advisory committee. The student, with the approval of the student's advisory committee, shall complete a program of study, which, at a minimum, shall consist of the following:

FOUNDATION BODY OF KNOWLEDGE

30 Semester Hours

In Finance the foundation body of knowledge includes (a) the *Common Body of Knowledge* of the Master's in Business Administration Degree, or its equivalent, and (b) graduate credit hours (6 semester hours—total) in macro- and microeconomic theory.

For Accounting this requirement may be satisfied in any of the four following ways: (1) M.S.A., (2) M.S.T., (3) master's degree from an accredited program plus CPA, or (4) a Florida 150 hour CPA that includes certain accounting courses deemed essential by the Accounting Ph.D. Coordinator or the student's advisory committee.

Any selected alternative must include a graduate-level microeconomics course and a graduate-level macroeconomics course.

MAJOR CONCENTRATION

15 or 16 Semester Hours

Students must select a major concentration from Accounting with a 16-hour minimum or Finance with a 15-hour minimum.

Accounting Major:

16 Semester Hours

ACG	7157	Seminar in Financial Accounting Research	3 hours
ACG	7887	Accounting Research Forum (Workshop, 1 hour credit per semester)	4 hours
ACG	7915	Directed Research in Accounting	3 hours
Two other seminars from the following (3 hours each):			6 hours
ACG	7399	Seminar in Management Accounting Research	
ACG	7699	Seminar in Auditing Research	
TAX	7066	Seminar in Doctoral Tax Research	

Finance Major:

15 Semester Hours

FIN	7811	Corporate Finance Theory	3 hours
FIN	7816	Investment Theory	3 hours

FIN	7813	Seminar in Financial Institutions and Markets	3 hours
FIN	7930	Seminar in Finance	3 hours
FIN	7915	Directed Research in Finance	3 hours

MINOR CONCENTRATION

9 Semester Hours

Students must select a minimum of nine hours in a unified area approved by the student's doctoral study advisory committee. Each student's program of study is individually tailored to accommodate student interests whenever possible, and this course work may be developed from offerings in the following disciplines with the advice and consent of the respective departments and advisory committee:

Accounting	Computer Science
Economics	Statistics
Finance	Political Science
Management	Sociology
Marketing	Engineering
Psychology	Mathematics

RESEARCH TOOLS

15 Semester Hours

The research tools requirement is intended to ensure a thorough exposure to research methods. All candidates are expected to demonstrate knowledge of mainframe and personal computers. Knowledge and use of available data bases and software are also expected. The required course work must include the following two areas (a total of 6 semester credit hours):

GEB 7910 Research Methods in Business

QMB 7565 Applied Business Statistics

The remaining 9 semester hours (in addition to the minor concentration) typically are selected from offerings in the following disciplines:

Accounting	Sociology	Computer Science
Economics	Psychology	Mathematics
Statistics	Management Science	
Engineering		

DISSERTATION

6-24 Semester Hours

Total Doctoral Program Hours Required:

75-94 Semester Hours

CANDIDACY EXAMINATION

The student must successfully complete a comprehensive Candidacy Examination. This examination has written and oral parts, and covers the candidate's program of study. Students are admitted to candidacy after satisfying all general degree requirements, passing the comprehensive examination, fulfilling the residency requirement, and successfully defending a written dissertation proposal in an oral examination conducted by the student's advisory/dissertation committee.

FINAL DEFENSE

The successful completion of a final oral examination is required. This examination concentrates on, but is not limited to, the student's dissertation defense.

List of Courses—College of Business Administration

ACG 5005 Financial Accounting Concepts

3 cr (3,0)

PR: Acceptance into the graduate program. The conceptual background for financial statements. (Not open to accounting majors.)

ACG 5206 Financial Accounting V

3 cr (3,0)

PR: ACG 4123 or C.I. and meet School admission requirements. Problems of partnerships, accounting for branches, bankruptcy, installment sales, accounting for estates and trusts, and interim reporting.

- ACG 5255 International and Multinational Accounting** **3 cr (3,0)**
 PR: ACG 4123 or C.I. and meet School admission requirements. An examination of the environmental factors affecting international accounting concepts and standards. Cross-country differences in accounting treatments are compared.
- ACG 5346 Cost Accounting II** **3 cr (3,0)**
 PR: ACG 3361, ACG 4123, FIN 3403, ECO 3411 or C.I. and meet School admission requirements. Continuation of ACG 3361. Overhead and joint cost allocation, capital budgeting and analysis, EOQ analysis, decentralization, and quantitative decision analysis.
- ACG 5435 Accounting Control Systems** **3 cr (3,0)**
 PR: Graduate standing, ACG 3361 and ACG 3401, or ACG 5625, or C.I. An integrative course designed to provide a systematic approach to the integration of financial accounting, managerial accounting, taxation, and general business courses.
- ACG 5506 Managerial Accounting for Governmental and Nonprofit Organizations** **3 cr (3,0)**
 PR: ACG 3501, ACG 4123 or C.I. and meet School admission requirements. Study of problems and methods of applying managerial accounting concepts in a nonprofit environment.
- ACG 5625 Auditing and EDP** **3 cr (3,0)**
 PR: ACG 3401, ACG 4123, ACG 4651 and meet School admission standards. An examination of auditing procedures followed when a company uses a computer to process financial records.
- ACG 5636 Advanced Auditing** **3 cr (3,0)**
 PR: ACG 3401, ACG 4123, ACG 4651, STA 3023 and meet School admission requirements. A continuation of ACG 4651. Special topics relative to the standards, practices and procedures followed in the audit function.
- ACG 5675 Operational Auditing** **3 cr (3,0)**
 PR: ACG 4123 and ACG 4651 and meet School admission requirements. The standards, principles, practices and procedures followed in the internal audit function.
- ACG 6356 Seminar in Cost Accounting** **3 cr (3,0)**
 PR: ACG 5346, graduate standing and all foundation courses for the accounting program or equivalents. A study of current selected topics in cost and management accounting.
- ACG 6405 Accounting Information Systems II** **3 cr (3,0)**
 PR: Graduate standing and all foundation courses for the accounting program or equivalents. Design and analysis of information systems and special auditing topics.
- ACG 6425 Managerial Accounting Analysis** **3 cr (3,0)**
 PR: Graduate standing and ACG 5005, or one year of accounting, and ECO 5413. (Not open for accounting majors.) Accounting as an information measurement system for internal planning and control.
- ACG 6696 Seminar in Auditing** **3 cr (3,0)**
 PR: ACG 5636, graduate standing and all foundation courses for the accounting program or equivalents. A study of current selected auditing topics.
- ACG 6697 Seminar in Auditing for Government and Nonprofit Organizations** **3 cr (3,0)**
 PR: Graduate standing and all foundation courses for the accounting program or equivalents. Examination of standards for audit of governmental organizations and programs; institutional issues of auditor independence; reporting audit findings in a public-sector environment.
- ACG 6805 Seminar in Accounting Theory** **3 cr (3,0)**
 PR: Graduate standing and all foundation courses for the accounting program or equivalents. An examination of the evolution of contemporary accounting theory with emphasis on current and future developments.
- ACG 6806 Seminar in Professional Accounting Issues** **3 cr (3,0)**
 PR: Graduate standing and all foundation courses for the accounting program or equivalents. An examination of current issues confronting the accounting profession.
- ACG 6895 Professional Accounting Practice** **3 cr (3,0)**
 PR: Graduate standing and all foundation courses for the accounting program or equivalents. Study of the formation and operation of a professional accounting practice.
- ACG 6946 Internship** **3 cr**

- ACG 7157 Seminar in Financial Accounting Research** 3 cr (3,0)
PR: Admission to doctoral program, equivalent of Master's degree in Accounting or Taxation, QMB 7565, and GEB 7910; and C.I. Extensive coverage of empirical literature dealing with bankruptcy prediction, earnings forecasting, income smoothing, information content, analytical review and related financial accounting research.
- ACG 7399 Seminar in Management Accounting Research** 3 cr (3,0)
PR: Admission to doctoral program, ACG 7157, and C.I. Extensive study of the theoretical aspects and empirical literature on accounting decision support; emphasizing human information processing, non-financial measures of effectiveness, and field research of existing practice.
- ACG 7698 Directed Research Project in Auditing** 3 cr (3,0)
PR: Admission to doctoral program and ACG 7699, or C.I. Highly individualized research project on a specific auditing research issue. Includes proposals development, methodology, data gathering, analysis, and reporting results.
- ACG 7699 Seminar in Auditing Research** 3 cr (3,0)
PR: Admission to doctoral program, ACG 7157, and C.I. A thorough review and critical analysis of auditing research literature, with emphasis on emerging research issues and methods.
- ACG 7887 Accounting Research Forum** 1 cr (1,0)
PR: Admission to doctoral program. Research and pedagogical issues in accounting, including research presentations by faculty, doctoral students, and invited scholars. May be taken for 4 hours credit.
- ACG 7915 Directed Research in Accounting** 3 cr (3,0)
PR: GEB 7910 and C.I. Advanced study in specialized areas of accounting research. Study designed to lead towards publishable research or student's dissertation. By definition, topical areas will vary.
- BUL 5125 Legal and Social Environment of Business** 3 cr (3,0)
PR: Admission to graduate program. Analysis of the legal and ethical environment of business, the effects of legislation and regulation on business activity, and the role of law and ethics in the decision making process.
- ECO 5005 Economic Concepts** 3 cr (3,0)
PR: Acceptance into the graduate program. Introduction to micro- and macro-economic analysis.
- ECO 5415 Statistics for Business and Economics** 3 cr (3,0)
PR: Acceptance into the graduate program and MAC 3233 or equivalent. Statistical theory and problems relating to business and economics including time series and correlation theory, index number theory and statistical inference.
- ECO 6115 Economic Analysis of the Firm** 3 cr (3,0)
PR: Graduate standing and ECO 5005 or equivalent. Commodity price and output determination; factor price determination and functional income distribution; analysis of different types of markets.
- ECO 6206 Aggregate Economic Conditions and Analysis** 3 cr (3,0)
PR: Graduate standing and ECO 5005 or equivalent. An analysis of aggregate economic conditions including the determination of output, employment and income levels.
- ECO 6226 Seminar in Money, Banking and Monetary Policy** 3 cr (3,0)
PR: Graduate standing. Study of the structural foundation and policy making activities of the monetary authorities.
- ECO 6266 Business Cycles and Forecasting** 3 cr (3,0)
PR: ECO 5005 and ECO 6416 or equivalents, graduate standing. Use of economic tools for measuring changes in aggregate economic activity, changes in production and prices, and the use of statistical techniques.
- ECO 6305 History of Economic Thought** 3 cr (3,0)
PR: Graduate standing. A study of the leading ideas of the major contributors to the development of economic thought.
- ECO 6416 Statistical Methods for Business Decisions** 3 cr (3,0)
PR: Graduate standing and ECO 5415 or equivalent. Multivariate models, time series models, and accompanying problems are analyzed and applied to forecast situations.
- ECO 6424 Econometrics** 3 cr (3,0)
PR: ECO 6416 and graduate standing. The mathematical formulation of economic theories and the use of statistical procedures to measure the theoretical relationships and to verify or reject the theories.

- ECO 6505 Public Finance and Fiscal Policy** 3 cr (3,0)
PR: Graduate standing and ECO 5005 or equivalent. Analysis of the role of government and the effects of spending, taxing, and borrowing on the economy.
- ECO 6705 Seminar in International Economics** 3 cr (3,0)
PR: Graduate standing. An inquiry into the theory of international trade and finance, commercial policy and economic integration.
- ECP 6205 Labor Economics** 3 cr (3,0)
PR: Graduate standing and ECO 5005 or equivalent. An investigation into the nature and function of the labor markets, with specific concern for both institutional and noninstitutional imbalance.
- ECP 6405 Industrial Organization and Performance** 3 cr (3,0)
PR: Graduate standing and ECO 6115. A study of the performance of various types of market structure and practice relative to price and efficiency.
- ECP 6426 Economics of Regulated Industries** 3 cr (3,0)
PR: Graduate standing. A study of the economic, legal, and administrative foundations of regulatory policy in a broad range of industries in the American economy.
- ECP 6605 Economics of Urban and Regional Problems** 3 cr (3,0)
PR: Graduate standing and ECO 6115. Economic analysis of the problems arising from and associated with the growth and development of cities and regions.
- ECP 6705 Managerial Economics** 3 cr (3,0)
PR: Graduate standing and ECO 6115 or equivalent. The use of economic tools and methods of reasoning applied to a wide range of business and economic problems.
- ECS 6006 Seminar in Comparative Economic Systems** 3 cr (3,0)
PR: Graduate standing. An examination of factors that influence economic systems, patterns of resource allocation and income distribution in differing economic environments.
- ECS 6015 Economic Development** 3 cr (3,0)
PR: Graduate standing. Analysis of theories and problems of growth and development with special attention to resource scarcity, population growth, and interaction of foreign trade and internal development.
- FIN 5405 Financial Concepts** 3 cr (3,0)
PR: Acceptance into the graduate program, ACG 5005 and ECO 5005 and ECO 5415 or equivalents. Effects of financial decisions upon the firm, interrelationships of these effects and alternatives available to financial managers in making these financial decisions.
- FIN 6406 Financial Analysis and Management** 3 cr (3,0)
PR: Graduate standing and FIN 5405 or equivalent. Conceptual and practical problems associated with financial management of the nonfinancial corporation.
- FIN 6425 Asset Management and Financial Decisions** 3 cr (3,0)
PR: Graduate standing and FIN 6406. Considers the interrelated decision making process of asset allocations, corporate fund raising, dividend policies and market maximization.
- FIN 6506 Analysis of Investment Opportunities** 3 cr (3,0)
PR: Graduate standing and FIN 6406. Deals with the theory and tools of analysis required in the management of financial assets.
- FIN 6627 International Financial Management** 3 cr (3,0)
PR: ECO 6415, FIN 6406. The theory of finance as applied to the operations of multinational firms and international capital markets.
- FIN 7811 Corporate Finance Theory** 3 cr (3,0)
PR: Admission to the Business doctoral program and FIN 6406 or equivalent; ECO 6416 or equivalent; or consent of instructor. Elaborate coverage of significant theoretical/classical literature and review of empirical literature to provide a sound framework of conceptual knowledge for doctoral students.
- FIN 7813 Seminar in Financial Markets and Institutions** 3 cr (3,0)
PR: Admission to business doctoral program and FIN 6406 or equivalent, ECO 6416 or equivalent, and consent of instructor. Extensive study of the theoretical and empirical literature dealing with current theory of the operation of financial markets and financial intermediaries.
- FIN 7816 Investment Theory** 3 cr (3,0)
PR: Admission to business doctoral program, FIN 7811, QMB 7565, and consent of instructor. Extensive

coverage of theoretical and empirical literature dealing with modern investment thought, portfolio theory, capital market equilibrium, and related topics.

FIN 7915 Directed Research in Finance

3 cr (3,0)

PR: FIN 7813, FIN 7816, and C.I. Advanced study of theory and evidence in specialized areas of Finance. Study designed to lead towards student's dissertation. By definition, topical areas will vary.

FIN 7930 Seminar in Finance

3 cr (3,0)

PR: FIN 7813, FIN 7816, and C.I. Study of private sector financial theory, policy, empires, and decision-making.

GEB 6311 Entrepreneurship

3 cr (3,0)

PR: Graduate standing. Seminar on topics concerning the entrepreneurial process in small and large organizations, including need assessment, sources and methods of innovation, financing, and barriers to entrepreneurship.

GEB 7910 Research Methods in Business

3 cr (3,0)

PR: Admission to Business doctoral program and ECO 6416 or equivalent; or consent of instructor. A foundation research course in business, exposing students to a full range of research experiences.

ISM 5021 Introduction to Management Information Systems

3 cr (3,0)

PR: Acceptance into the graduate program. Designed to provide the student with the fundamentals of business data processing and management information systems used by organizations in a modern society.

ISM 6121 Systems Analysis and Development

3 cr (3,0)

PR: MAN 5051 and graduate standing. Study and application of systems concepts for the improvement of organizational work and information systems.

ISM 6305 Information Resources Management

3 cr (3,0)

PR: ISM 5021, MAN 5051, MAN 5501 and graduate standing. An advanced study of information system management including system planning, project selection and management, and organizational information management policies.

ISM 6395 Seminar: Management Information System

3 cr (3,0)

PR: ISM 6305, ISM 6121 and graduate standing. This seminar covers theoretical foundations and current research directions in Management Information Systems. Topics include organizational and managerial processing; systems design, development and implementation.

MAN 5051 Management Concepts

2 cr (2,0)

PR: Acceptance into the graduate program. Theory and practice of managing organizations to include planning, organizational theory, human behavior and control.

MAN 5501 Introduction to Production/Operations Management

2 cr (2,0)

PR: Acceptance into the graduate program and ECO 5415 or equivalent. Introduction to the fundamental concepts, processes and institutions involved in the production of goods and services required by modern society.

MAN 6055 Planning and Control Analysis

3 cr (3,0)

PR: Graduate standing and MAN 5051 or equivalent. Emphasizes elements of the planning and control processes including objectives, action programs and control procedures. Discusses integration of the two processes.

MAN 6075 History of Management Thought

3 cr (3,0)

PR: Graduate standing and MAN 5051. The historical development of management in modern society with emphasis on the interrelationship between the management processes and the economic, social, and political environments.

MAN 6121 Group Decisions and Analysis

3 cr (3,0)

PR: Graduate standing and MAN 5051 or equivalent. Experience in company-wide management decision making by groups using the management game techniques. Analysis of the group decision-making process using video tapes.

MAN 6156 Personnel Resources Administration

3 cr (3,0)

PR: Graduate standing. A seminar in integrating the personnel, manpower planning, and labor relations fields through the study of concepts and problems in these areas.

MAN 6158 Human Resources Management Issues

3 cr (3,0)

PR: MAN 6156 or C.I. A course providing advanced study in selected topics of current interest in Human Resource Management.

- MAN 6206 Organizational Behavior and Development** 3 cr (3,0)
PR: Graduate standing and MAN 5051 or equivalent. The analysis of human behavior in organizations in terms of the individual, small group, intergroup relationships, and the total organization.
- MAN 6547 Expert Systems for Business Application** 3 cr (3,0)
PR: C.I. if non-Business student. An introduction and application of the fundamentals of artificial intelligence (AI) knowledge-based expert systems technology to problem solution needs of business and other disciplines.
- MAN 6565 Production/Operations Analysis** 3 cr (3,0)
PR: MAN 5051, MAN 5830 or equivalents and MAN 6814. Study of the production/operations environment and the development of the organization's operations strategy and plan.
- MAN 6721 Business Policy and Responsibility** 3 cr (3,0)
PR: Graduate standing and completion of all MBA professional core courses or their equivalent. MBA program capstone course providing the student experience in formulating policy and strategy for the direction of a business firm from the integrated viewpoint of a CEO.
- MAN 6814 Quantitative Models for Business Decisions** 3 cr (3,0)
PR: Graduate standing and ECO 5413 or equivalent. Quantitative techniques useful for the solution of business problems. Mathematical model building to aid the decision making process is stressed.
- MAN 6840 Research and Development Management** 3 cr (3,0)
PR: Graduate standing and MAN 5051. An examination of the function of research and development and the impact of technological innovation on our economic and social systems.
- MAR 5055 Marketing Concepts** 3 cr (3,0)
PR: Acceptance into the graduate program. Study of functions, institutions and basic marketing of goods in the U.S. economy.
- MAR 5941 Small Business Consulting** 3 cr (3,0)
PR: ACG 2001, ACG 2011, ECO 2013, MAN 3010, MAR 3023, or graduate status. Provides students opportunity to apply knowledge learned in the classroom to real business situations. Open to undergraduate majors in the College of Business Administration with approval of the department chair.
- MAR 6077 Contemporary Marketing Problems** 3 cr (3,0)
PR: Graduate standing, MAR 6816, or C.I. Analysis of contemporary marketing problems resulting from social, economic, and political developments.
- MAR 6406 Sales Management and Control** 3 cr (3,0)
PR: Graduate standing and MAR 5505 or equivalent. Designed to provide an analysis of the sales and management process. Topics covered include selection and training, compensation, behavioral issues and sales planning, evaluation, and control.
- MAR 6456 Advanced Industrial Marketing Management**
PR: MAR 5055 or equivalent or C.I. This course provides a comprehensive introduction to the distinctive characteristics of industrial markets. The course reviews what is known about organizational buying behavior which provides the foundation necessary to formulate marketing strategies.
- MAR 6616 Marketing Research Methods** 3 cr (3,0)
PR: Graduate standing. Investigation of primary research methods used to generate information for marketing decision makers. Problem definition, research design, data collection, data processing, statistical interpretation, and communication of research results.
- MAR 6666 Marketing Models**
PR: MAR 6816 & ECO 6416. This course provides a working knowledge and managerial perspective on a range of marketing models and their associated analytical techniques.
- MAR 6816 Marketing Policy** 3 cr (3,0)
PR: Graduate standing and MAR 5055 or equivalent. Marketing policy formulation and decision making with respect to planning, pricing, promotion and distribution.
- MAR 6845 Services Marketing**
PR: MAR 5055 or equivalent or C.I. Marketing in services industries is the focus of study with particular emphasis on unique aspects of services marketing, the service marketing mix, and the implementation of service strategies.
- OMB 7565 Applied Statistical Business Decision Models** 3 cr (3,0)
PR: Admission to Business doctoral program; ECO 6416 or equivalent; or consent of instructor. Logic

and procedures used in research and data evaluation in the business sciences applying advanced statistical models to decision-making problems.

REE 6306 Corporate Real Estate Investment Decision-Making

3 cr (3,0)

PR: Acceptance into the graduate program and FIN 5405 or equivalent. Study of the theory and practice of location, acquisition, management and disposition of corporate real estate assets.

RMI 6008 Risk Management

3 cr (3,0)

PR: Acceptance into the graduate program and FIN 5405 or equivalent. An introduction to risk management with emphasis on the business firm, but also treating several major risk management issues in the public sector.

TAX 5015 Federal Income Tax II

3 cr (3,0)

PR: ACG 4123, TAX 4001 and meet School admission requirements. Concepts and methods of determining taxable income for partnerships and corporations and selected topics.

TAX 6065 Seminar in Tax Research

3 cr (3,0)

PR: Graduate standing and all foundation courses for the accounting program or equivalents. Advanced study of and research in tax law. Procedures governing tax controversies and tax compliance.

TAX 6135 Seminar in the Taxation of Corporations and Shareholders

3 cr (3,0)

PR: TAX 5015 and graduate standing and all foundation courses for the accounting program. Federal taxation relating to corporate organization, distributions, liquidations, accumulations and reorganizations.

TAX 6205 Seminar in the Taxation of Partnership Income

3 cr (3,0)

PR: TAX 5015 and graduate standing and all foundation courses for the accounting program. Federal taxation relating to partnership income including formation, distributions and retirements.

TAX 6405 Seminar in the Taxation of Estates, Gifts and Trusts

3 cr (3,0)

PR: TAX 5015 and graduate standing and all foundation courses for the accounting program. Federal and Florida estate and inheritance taxes; taxation of gifts and trusts.

TAX 6845 Seminar in Tax Planning

3 cr (3,0)

PR: TAX 5015 and graduate standing and all foundation courses for the accounting program. Substantive provisions of federal tax law; tax planning from a business viewpoint; case studies of the effect of tax law on business decisions.

TAX 6971 Thesis

1-6 cr

TAX 7066 Seminar in Doctoral Tax Research

3 cr (3,0)

PR: Admission to doctoral program, ACG 7157, and C.I. A review and critical analysis of tax research literature, with emphasis on emerging issues, methodology, and data gathering.

COLLEGE OF EDUCATION

Advanced courses through the College of Education are for students with at least baccalaureate degrees. Both degree and non-degree programs may be planned for people in education-related positions in social and government agencies, business and industry, as well as for professional educators in private and public schools. Master of Education and Master of Arts degrees are awarded. Educational Specialist and Doctor of Education degrees are available in Educational Leadership and Curriculum/Instruction. Programs in the College of Education are accredited by NCATE (The National Council for the Accreditation of Teacher Education).

COLLEGE ADMINISTRATION

W. H. Johnson Dean
M. A. Lynn Associate Dean
J. H. Armstrong Assistant Dean

M. A. Lynn Graduate Program Coordinator
Office: ED 328, Phone (407) 823-3382

Faculty

B. B. Anderson, Ed.D. Professor
D. J. Baumbach, Ed.D. Professor
W. C. Bozeman, Ph.D. Chair, Department of Educational Services and Professor
D. K. Brumbaugh, Ed.D. Professor
M. W. Churton, Ed.D. Chair, Department of Exceptional and
Physical Education and Professor
W. Clarke, Ed.D. Professor
R. G. Cowgill, Ph.D. Professor
C. D. Dziuban, Ph.D. Professor
H. O. Hall, Ed.D. Professor
D. E. Hernandez, Ed.D. Professor
M. C. Hynes, Ph.D. Professor
A. R. Joels, Ph.D. Professor
W. H. Johnson, Ph.D. Dean and Professor
D. R. Kirby, Ed.D. Chair, Department of Instructional Programs
and Professor
M. L. Kysilka, Ph.D. Professor
R. Lange, Ph.D. Professor
M. A. Lynn, Ed.D. Associate Dean and Professor
N. R. McGee, Ed.D. Professor
P. C. Manning, Ed.D. Professor
R. D. Martin, Ed.D. Professor
D. J. Meador, Ph.D. Professor
J. Midgett, Ed.D. Professor
J. L. Olson, Ph.D. Professor
M. J. Palmer, Ed.D. Professor
F. D. Rohter, Ph.D. Professor
R. A. Rothberg, Ed.D. Professor
R. A. Thompson, Ed.D. Professor
J. H. Armstrong, Ed.D. Assistant Dean and Director, Student Internships
and Associate Professor
R. A. Bailey, Ph.D. Associate Professor
J. S. Beadle, Ph.D. Associate Professor
K. L. Biraimah, Ph.D. Associate Professor
D. M. Blume, Ed.D. Associate Professor
R. M. Bollet, Ed.D. Associate Professor
R. A. Cornell, Ed.D. Associate Professor

L. Cross, Ph.D.	Associate Professor
R. L. Driscoll, Ed.D.	Associate Professor
G. R. Gergley	Associate Professor
D. W. Gurney, Ph.D.	Associate Professor
T. L. Harrow, Ph.D.	Associate Professor
S. L. Hiett, Ph.D.	Associate Professor
P. E. Higginbotham, Ed.D.	Associate Professor
M. H. Hopkins, Ph.D.	Associate Professor
L. R. Hudson, Ph.D.	Associate Professor
J. N. McLain, Ph.D.	Associate Professor
J. A. Miller, Ed.D.	Associate Professor
M. Miller, Ed.D.	Associate Professor
G. W. Orwig, Ed.D.	Associate Professor
R. F. Paugh, Ed.D.	Associate Professor
J. M. Platt, Ed.D.	Associate Professor
J. W. Powell, Ed.D.	Associate Professor
P. T. Sciortino, Ph.D.	Associate Professor
B. W. Siebert, Ph.D.	Associate Professor
S. E. Sorg, Ph.D.	Associate Professor
T. J. Sullivan, Ed.D.	Associate Professor
K. Williams, Ph.D.	Associate Professor
A. T. Wood, Ph.D.	Chair, Department of Educational Foundations and Associate Professor
K. W. Allen, Ph.D.	Assistant Professor
C. R. Balado, Ed.D.	Assistant Professor
D. J. Camp, Ph.D.	Assistant Professor
E. A. Clark	Assistant Professor
J. W. Cornett, Ph.D.	Assistant Professor
T. P. Daly, Ph.D.	Assistant Professor
R. M. Everett, Ph.D.	Assistant Professor
M. Hill, Ed.D.	Assistant Professor
L. C. Holt, Ed.D.	Assistant Professor
V. W. Ikpa, Ph.D.	Assistant Professor
K. E. McGhee, Ph.D.	Assistant Professor
H. P. Martin, Ed.D.	Assistant Professor
S. E. Ortiz, Ed.D.	Assistant Professor
R. Priest, Ph.D.	Assistant Professor
J. Ratliff, Ph.D.	Assistant Professor
K. H. Renner	Assistant Professor
D. W. Sanford, Ed.D.	Assistant Professor
M. L. While, Ed.D.	Assistant Professor

PROGRAMS IN EDUCATION

MASTER'S DEGREES

Art Education
Business Education
Counselor Education
Educational Leadership
Educational Media
Elementary Education
English Education
Exceptional Child
Instructional Systems

Mathematics Education
Music Education
Physical Education
Reading Education
Science Education
Secondary Education
Social Science Education
Vocational Education

EDUCATIONAL SPECIALIST DEGREES

School Psychology
Educational Leadership
Curriculum and Instruction

DOCTOR OF EDUCATION DEGREES

Educational Leadership
Curriculum and Instruction

MASTER'S DEGREES

Admission

The Graduate Record Examination (GRE) is required of all graduate students. Minimal requirements for admission are 1) a grade point average (GPA) of 3.0 for the last 60 semester hours of undergraduate study and a minimum score of at least 840 on the verbal-quantitative sections of the GRE or 2) a GPA of less than 3.0 combined with a GRE of 1000 or above. In addition, a student seeking a Master of Education degree must show evidence that all course work has been completed for the basic bachelor's level State of Florida teaching certificate. Master of Arts programs, available in some specialties, may be planned without the student's having previously completed certification courses.

Provisional Admission

Students who fail to meet University admissions standards have the opportunity to apply for admission via the provisional category. To be considered for provisional admission, students must file an application for provisional status in the Education Records and Advisement Center. Department committees make recommendations to the College Dean. The following criteria are applied in evaluating applications:

- a. Ranking of undergraduate grade point average
- b. Ranking of GRE score
- c. Contribution, current and projected, to the profession
- d. Number of years of professional experience
- e. Number of post-baccalaureate hours taken
- f. Grade point average on any post-baccalaureate work
- g. Recommendations by college faculty and other professionals

Provisional students who do not maintain a 3.0 GPA during their first nine hours of enrollment will be reverted to post-baccalaureate status.

Program of Study

Students are officially assigned formal academic advisors only upon admission to a College of Education graduate degree program. It is each student's responsibility to seek academic advisement and to finalize a plan of study early in the degree program. The acceptability and application of post-baccalaureate/transfer hours toward a degree is contingent on the recommendation of the academic advisor and is approved only after a plan of study has been officially filed through all University channels.

Academic advisors are not assigned to individuals admitted as post-baccalaureate students. Post-baccalaureate students may seek information and general advisement in the Education Records and Advisement Center.

Performance Standards

Minimum University-wide standards and regulations are applicable in addition to the specific College of Education requirements and regulations described in this section. In addition to the minimum University standard of maintaining a "B" (3.0 GPA) on all graduate work and earning no more than 6 hours of "C" work or unresolved "I" (incomplete) grades, College of Education students must maintain at least a "C" (2.0 GPA) in all co-requisite work prescribed in concert with a graduate degree program.

Students whose grade point average on degree work falls below 3.0 will be placed on academic provisional status for a nine semester-hour period of enrollment. During this time, the GPA must reach or exceed the 3.0 minimum to remain in the program. Only one academic provisional period is permitted, and no transfer credit may be applied.

Comprehensive Examination

Prior to graduation, all students are required to successfully complete a written comprehensive examination which is planned and evaluated by each student's major department. Failure on a comprehensive examination requires re-enrollment and re-examination during a subsequent semester.

Thesis/Research Report/Non-thesis Option

Master's degree students in Education, in consultation with advisors, may select one of three options: typically, thesis and research report options require a minimum of 33 semester hours while the non-thesis option requires a minimum of 36 hours.

MASTER'S DEGREE PROGRAMS IN EDUCATION

Programs are offered in a wide variety of areas within the general field of education. Master of Education programs are open only to students who have a baccalaureate degree and have completed course work for regular Florida State Teaching Certification. Master of Arts programs are open to qualified individuals who are noncertified or for certified bachelor-level students pursuing a second teaching field. In this section, the degree components for the various programs are outlined. Students should consult faculty advisors for answers to specific questions.

ART EDUCATION

a. Art Education, K-12 (M.Ed.)

This program is designed to meet the expanded and deepening needs of the art teacher in the studio content areas, to examine contemporary problems in art education, review recent curriculum developments, study innovative developments, explore interdisciplinary concepts and become involved in research problems specific to the art teacher. This degree requires 33 semester hours and previous certification in art.

AREA A - CORE		12 Semester Hours
ARE 6971	Research Report	2,1 hours
EDF 6481	Fundamentals of Graduate Research in Education	3 hours
Choose one:		
EDF 6155	Lifespan Human Development and Learning	3 hours
EDF 6517	History and Philosophy of American Education	3 hours
EDF 6608	Social Factors in American Education	3 hours
Choose one:		
EDF 6401	Statistics for Educational Data	3 hours
EDF 6432	Measurement and Evaluation in Education	3 hours
AREA B - SPECIALIZATION		21 Semester Hours
ARE 5251	Art for Exceptionalities	3 hours
ARE 5255	Arts in Recreation	3 hours
ARE 5444	Jewelry Making	3 hours
ARE 5648	Contemporary Visual Arts Education	3 hours
ARE 6455	K-12 Art Instructional Materials I	3 hours
ARE 6456	K-12 Art Instructional Materials II	3 hours
ART 5109C	Crafts Design	3 hours

COREQUISITES: Prescribed by College of Education to meet State Certification requirements or as support for degree program. An undergraduate course or in-service credit may be used to satisfy the requirement.

Total Minimum Semester Hours Required: 33

b. Art Education (M.A.)

The Master of Arts program in Art is planned to provide the art-oriented person with a degree which includes certification. The 40-hour program meets state certification requirements in foundations, special methods in art education, general methods in teaching and the student teaching component. An M.A. program in Art Education can be arranged for the student who is not interested in becoming certified to teach art, but wants preparation for

museum work, art therapy, or becoming involved in life-long learning in art for adult education. Prerequisites depend on previous experience of the student.

AREA A - PROFESSIONAL CORE 18 Semester Hours

ARE	6971	Research Report	2,1 hours
EDF	6155	Lifespan Human Development and Learning	3 hours
EDF	6432	Measurement and Evaluation in Education	3 hours
EDF	6481	Fundamentals of Graduate Research in Education	3 hours
EDF	6517	History and Philosophy of American Education	3 hours
ESE	6325	Curriculum Theory	3 hours

or

EDE	6205	Elementary Curriculum	3 hours
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AREA B - SPECIALIZATION 12 Semester Hours

ARE	5251	Art for Exceptionalities	3 hours
ARE	5255	Arts in Recreation	3 hours
ARE	5444	Jewelry Making in Schools	3 hours
ARE	5648	Contemporary Visual Arts Education	3 hours
ARE	6455	K-12 Art Instructional Materials I (required)	3 hours
ARE	6456	K-12 Art Instructional Materials II (required)	3 hours
ART	5109C	Crafts Design	3 hours

AREA C - INTERNSHIP 10 Semester Hours

EDG	6940	Graduate Internship (or equivalent)	3 hours
EDG	6940	Graduate Internship	7 hours

COREQUISITES: Prescribed by College of Education to meet State Certification requirements or as support for degree program. An undergraduate course or in-service credit may be used to satisfy the requirement.

Total Minimum Semester Hours Required: 40

BUSINESS EDUCATION

a. Business Education (M.Ed.)

AREA A - CORE 12 Semester Hours

EDF	6481	Fundamentals of Graduate Research in Education	3 hours
ESE	6971	Research Report	2,1 hours

Choose one:

EDF	6155	Lifespan Human Development and Learning	3 hours
EDF	6517	History and Philosophy of American Education	3 hours
EDF	6608	Social Factors in American Education	3 hours

Choose one:

EDF	6401	Statistics for Educational Data	3 hours
EDF	6432	Measurement and Evaluation in Education	3 hours

AREA B - VOCATIONAL CORE 9 Semester Hours

BTE	6171	Business Education Curriculum	3 hours
EVT	6264	Administration in Vocational Education	3 hours
EVT	6265	Supervision in Vocational Education	3 hours

AREA C - SPECIALIZATION 12 Semester Hours

BTE	6425	Advanced Business Instruction Techniques	3 hours
BTE	6426	Office Simulation Techniques	3 hours
BTE	6935	Seminar in Business Education	3 hours
BTE	6946	Practicum Business Education	3 hours

AREA D - OPTIONAL ELECTIVES

EVT	5260	Cooperative Programs in Vocational Education	3 hours
EVT	6664	School/Community Relations for Vocational Education	3 hours
EVT	4066	Principles and Practices of Vocational Education	3 hours

Total Minimum Semester Hours Required: 33

b. Business Education (M.A.)

AREA A - PROFESSIONAL CORE			18 Semester Hours
EDF	6155	Lifespan Human Development and Learning	3 hours
EDF	6432	Measurement and Evaluation in Education	3 hours
EDF	6481	Fundamentals of Graduate Research in Education	3 hours
EDF	6517	History and Philosophy of American Education	3 hours
ESE	6235	Curriculum Design	3 hours
ESE	6971	Research Report	2,1 hours
AREA B - SPECIALIZATION			12 Semester Hours
Courses to be selected in consultation with an advisor. These hours must include a 5000- or 6000-level special methods course.			
AREA C - INTERNSHIP			10 Semester Hours
EDG	6940	Graduate Internship (or equivalent)	3 hours
EDG	6940	Graduate Internship	7 hours
COREQUISITES: Prescribed by the College of Education to meet State Certification requirements or as support for degree program. An undergraduate course or in-service credit may be used to satisfy the requirement.			

Total Minimum Semester Hours Required:

40

COUNSELOR EDUCATION

This program has four program options. The Master of Education degree program is designed to meet the needs of students who have a baccalaureate degree and have completed course work for regular Florida State Teaching Certification and plan to work as a counselor in a school setting (elementary, middle, secondary, post-secondary). This degree requires a minimum of 48 semester hours.

The second option is a Master of Arts degree program for the student who has a baccalaureate degree in a discipline other than education. This degree is for the student desiring certification in guidance for the public school, K-12, at the master's level. This degree program requires a minimum of 57 semester hours.

The third option is a Master of Arts degree program in mental health counseling for the student who is not interested in working in a school setting but is interested in other counseling employment (e.g., mental health agencies, employment service, vocational rehabilitation, juvenile courts, etc.). This program is planned to meet State of Florida license standards. A minimum of 60 semester hours is required.

The fourth option is a Master of Arts degree program in College Student Personnel Services for the student who is interested in working on college and university campuses in divisions of student affairs.

EGC 6791 Research Report may be substituted by two three semester hour courses. All program tracks require an internship experience. Mental Health counseling requires 900 clock hours and all others, 600 clock hours.

Admissions criteria: For consideration for admission to *any* of the counselor education program tracks, an applicant must secure, complete and submit by the deadline (Oct. 1st for Spring Term Admission, May 1st for Fall Term Admission), a special packet of materials for review by a faculty admissions committee. This material is separate from the University Graduate Admissions Application and may be obtained from the Educational Services Department office (ED 318). A formal interview is required and will be considered for final admission after the College of Education admission requirements are met. This program can accommodate a limited number of students; therefore, there is a possibility of being denied admission even when all criteria are met.

Exit requirements include:

1. Achieve at least a GPA of 3.0 in counseling specialization courses.
2. Achieve a B or better in EGC 6446 and EGC 6946.
3. Must be approved by the faculty of the program of the student's major.
4. Satisfactory passing comprehensive written examinations which may be taken after 2/3 of course work is completed.

The College reserves the right to refuse student entrance or terminate a student after admission to the Counselor Education Program, if in the judgment of the faculty, the student

demonstrates unacceptable personal fitness to work in the counseling field with children, youth, and/or adults.

a. School Counseling (M.Ed.)

AREA A - CORE		9 Semester Hours
EDF	6155	Lifespan Human Development and Learning 3 hours
EDF	6481	Fundamentals of Graduate Research in Education 3 hours
EGC	6971	Research Report 2,1 hours
AREA B - SPECIALIZATION		36 Semester Hours
EGC	5005	Introduction to the Counseling Profession 3 hours
EGC	6235	Procedures for Group Testing 3 hours
EGC	6317	Career Development 3 hours
EGC	6435	Theories of Individual Counseling 3 hours
EGC	6436	Techniques of Counseling 3 hours
EGC	6045	Counseling with Children and Adolescents 3 hours
EGC	6606	Organization and Administration of School Counseling and Guidance Programs 3 hours
EGC	6505	Group Procedures and Theories in Counseling 3 hours
EGC	6706	Consultation, Staffing, and Case Management 3 hours
EGC	6785	Ethical and Legal Issues 3 hours
EGC	6463	Counseling Special Populations 3 hours
EGC	6446	Practicum in Counseling 3 hours
AREA C - PROFESSIONAL FIELD EXPERIENCE		3 Semester Hours
EGC	6946	Counseling Internship 3 hours

Total Minimum Semester Hours Required: 48

b. School Counseling (M.A.)

AREA A - CORE		9 Semester Hours
EDF	6155	Lifespan Human Development and Learning 3 hours
EDF	6481	Fundamentals of Graduate Research in Education 3 hours
EGC	6971	Research Report 2,1 hours
AREA B - SPECIALIZATION		36 Semester Hours
EGC	5005	Introduction to the Counseling Profession 3 hours
EGC	6235	Procedures for Group Testing 3 hours
EGC	6317	Career Development 3 hours
EGC	6435	Theories of Individual Counseling 3 hours
EGC	6436	Techniques of Counseling 3 hours
EGC	6045	Counseling with Children and Adolescents 3 hours
EGC	6505	Group Procedures and Theories in Counseling 3 hours
EGC	6606	Organization and Administration of School Counseling and Guidance Programs 3 hours
EGC	6706	Consultation, Staffing, and Case Management 3 hours
EGC	6785	Ethical and Legal Issues 3 hours
EGC	6463	Counseling Special Populations 3 hours
EGC	6446	Practicum in Counseling 3 hours
AREA C - PROFESSIONAL FIELD EXPERIENCE		3 Semester Hours
EGC	6946	Counseling Internship 3 hours
AREA D - ADDITIONAL CERTIFICATION		9 Semester Hours
Foundations		3 Semester Hours
EDF	6517	History and Philosophy of American Education 3 hours
EDF	6608	Social Factors in American Education 3 hours
General Methods		6 Semester Hours
EDG	4324	Teaching in the Schools 3 hours
EDG	4321	Teaching Strategies 4 hours
EME	5051	Technologies of Instruction and Information Management 3 hours
EDA	6061	Organization and Administration of Schools 3 hours
EDS	6123	Educational Supervisory Practices I 3 hours
EDS	6130	Educational Supervisory Practices II 3 hours
ESE	6235	Curriculum Design 3 hours

ESE	6325	Curriculum Theory	3 hours
EDE	6205	Elementary School Curriculum	3 hours
Total Minimum Semester Hours Required:			57

c. Mental Health Counseling (M.A.)

Program For State Of Florida Licensure in Mental Health Counseling

AREA A - CORE			9 Semester Hours
EDF	6155	Lifespan Human Development and Learning	3 hours
EDF	6481	Fundamentals of Graduate Research in Education	3 hours
EGC	6971	Research Report	2,1 hours
AREA B - SPECIALIZATION			36 Semester Hours
EGC	5005	Introduction to the Counseling Profession	3 hours
EGC	6215	Individual Psycho-Educational Testing I	3 hours
EGC	6317	Career Development	3 hours
EGC	6426	Mental Health Care Systems	3 hours
EGC	6435	Theories of Individual Counseling	3 hours
EGC	6436	Techniques of Counseling	3 hours
EGC	6505	Group Procedures and Theories in Counseling	3 hours
EGC	6706	Consultation, Staffing, and Case Management	3 hours
EGC	6785	Ethical and Legal Issues	3 hours
EGC		Human Sexuality and Relationships	3 hours
CLP	5166	Advanced Abnormal Psychology	3 hours
PPE	5207	Personality Theories	3 hours
AREA C - COGNATE ELECTIVES			6 Semester Hours
EGC	6409	Current Trends in Counseling	3 hours
EGC	6414	Family Counseling I	3 hours
EGC	6415	Family Counseling II	3 hours
EGC	6461	Counseling Substance Use and Abuse	3 hours
EGC	6463	Counseling Special Populations	3 hours
EGC	6045	Counseling with Children and Adolescents	3 hours
EGC	6467	Counseling Older Persons/Their Families	3 hours
EGC	6515	Advanced Group Counseling	3 hours
AREA D - PROFESSIONAL FIELD EXPERIENCES			9 Semester Hours
EGC	6446	Practicum in Counseling I	3 hours
EGC	6446	Practicum in Counseling II	3 hours
EGC	6946	Counseling Internship	3 hours

Total Minimum Semester Hours Required: 60

d. Higher Education Student Personnel (M.A.)

AREA A - CORE			9 Semester Hours
EDF	6481	Fundamentals of Graduate Research	3 hours
(and)		in Education	
Choose one of the following two courses:			
EDF	6401	Statistics Educational Data	3 hours
EDF	6065	History and Philosophy of Higher Education	3 hours
EGC	6971	Research Report	2,1 hours
AREA B - SPECIALIZATION			24 Semester Hours
EGC	6055	Student Personnel Services in Higher Education	3 hours
EGC	6057	The College Community and the Student	3 hours
EDA	6540	Organization & Administration of Higher Education	3 hours
EDH	6505	Finance in Higher Education	3 hours
EGC	6785	Ethical and Legal Issues	3 hours
EGC	6317	Career Development	3 hours
EGC	6435	Theories of Individual Counseling	3 hours
EGC	6436	Techniques of Counseling	3 hours
AREA C - ELECTIVES			6 Semester Hours
EGC	5005	Introduction to the Counseling Profession	3 hours
EGC	6409	Current Trends in Counseling	3 hours

EGC	6461	Counseling Substance Use & Abuse	3 hours
EGC	6505	Group Procedures and Theories in Counseling	3 hours
EGC		Human Sexuality and Relationships	3 hours
EDF	6155	Lifespan Human Development & Learning	3 hours
EDA	7195	Politics, Government and Financing of Educational Organizations	3 hours
AREA D - PROFESSIONAL FIELD EXPERIENCES			9 Semester Hours
Choose one of the following two courses:			
EGC	6446	Student Affairs Practicum I	3 hours
EGC	6446	Practicum in Counseling I	3 hours
EGC	6446	Student Affairs Practicum II	3 hours
EGC	6946	Internship	3 hours

EDUCATIONAL LEADERSHIP

Two master's degree programs are offered in Educational Leadership: the Master of Education Degree (M.Ed.) and the Master of Arts Degree (M.A.). The M.A. option does not fulfill state certification requirements and requires 42 hours for completion.

The purpose of the Master of Education Degree (M.Ed.) in Educational Leadership is to prepare individuals for leadership positions and administrative careers in education. The M.Ed. Degree provides for two options:

Option I. Educational Leadership is a 39-semester hour program of study applicable toward Florida Educational Leadership Certification which is designed to provide the theoretical and conceptual knowledge base required for the principalship, and for Florida Level I Educational Leadership Certification. Courses required in the program address the eight competency domains specified by the Florida Department of Education and included in the Florida Educational Leadership Examination (FELE). Educational Leadership Certification is subject to Florida Department of Education approval. Three years of teaching experience and the Florida Educational Leadership Examination are required by the State of Florida for certification in Educational Leadership.

Option II. Curriculum and Instruction is a 33-hour program of study designed to prepare classroom teachers who wish to remain in the classroom as teachers, team leaders, departmental chairpersons, peer teachers or curriculum resource teachers.

a. Educational Leadership (M.Ed.)

AREA A - CORE			9 Semester Hours
EDF	6481	Fundamentals of Graduate Research in Education	3 hours
EDF	6432	Measurement and Evaluation in Education	3 hours
Choose one:			
EDF	6155	Lifespan Human Development and Learning	3 hours
EDF	6517	History and Philosophy of American Education	3 hours
EDF	6608	Social Factors in American Education	3 hours
AREA B - EDUCATIONAL LEADERSHIP			21 Semester Hours
EDA	6061	Organization and Administration of Schools	3 hours
EDA	6232	Legal Aspects of School Operation	3 hours
EDA	6240	Educational Financial Affairs	3 hours
EDA	6260	Educational Systems Planning and Management	3 hours
EDA	6502	Organization and Administration of Instructional Programs	3 hours
EDS	6123	Educational Supervisory Practices I	3 hours
EDS	6130	Educational Supervisory Practices II	3 hours
AREA C - PROGRAM EMPHASIS (Curriculum and Instruction)			6 Semester Hours
Electives in Curriculum and Instruction from one of the following areas:			
EDG	6223	Curriculum Theory and Organization*	3 hours
EDG	6253	Curriculum Inquiry*	3 hours

AREA D - INTERNSHIP/RESEARCH REPORT 3 Semester Hours
 The Master of Education program of study in Educational Leadership provides for a graduate internship and end-of-project report **OR** a Thesis option.

EDA	6946	Graduate Internship	3 hours
	or		
EDA	6971	Thesis	3 hours

Total Minimum Semester Hours Required: 39

*Both curriculum courses must be taken at *one* of the following designated levels: elementary, middle school, exceptional education, secondary.

b. Educational Leadership Option (M.A.)

This Master of Arts degree program does not lead to Certification in Educational Leadership.

AREA A - CORE			15 Semester Hours
EDF	6155	Lifespan Human Development and Learning	3 hours
EDF	6481	Fundamentals of Graduate Research in Education	3 hours
EDF	6517	History and Philosophy of American Education	3 hours
	or		
EDF	6608	Social Factors in American Education	3 hours
EDF	6401	Statistics for Educational Data	3 hours
	or		
EDF	6432	Measurement and Evaluation in Education	3 hours
EDA	6971	Treatise	2,1 hours

AREA B - SPECIALIZATION 9 Semester Hours
 Courses will be selected with approval of the advisor.

AREA C - ADMINISTRATION			18 Semester Hours
EDA	6061	Organization and Administration of Schools (required)	3 hours
EDA	6232	Legal Aspects of School Operation	3 hours
EDA	6240	Educational Financial Affairs	3 hours
EDA	6260	Educational Systems Planning and Management	3 hours
EDA	6502	Organization and Administration of Instructional Programs (required)	3 hours
EDG	6940	Graduate Internship (required)	3 hours
EDS	6123	Educational Supervisory Practices I	3 hours
	or		
EDS	6130	Educational Supervisory Practices II	3 hours

Total Minimum Semester Hours Required: 42

c. Curriculum and Instruction Option (M.Ed.)

AREA A - CORE REQUIREMENTS			15 Semester Hours
EDF	6481	Fundamentals of Graduate Research in Education	3 hours
EDF	6432	Measurement & Evaluation in Education	3 hours
EDG	6xxx	Principles of Instruction and Learning	3 hours
EDG	6223	Curriculum Theory and Organization	3 hours
EDF	6517	History and Philosophy of American Education	3 hours
AREA B - PROFESSIONAL DEVELOPMENT			12 Semester Hours
EDG	6046	Contemporary Issues in Education	3 hours
EDS	6123	Educational Supervisory Practices I	3 hours
EDF	6233	Analysis of Classroom Teaching	3 hours
EDG	6946	Practicum	3 hours
AREA C - ELECTIVES			6-9 Semester Hours
OPTION I			Research (6 semester hours)
EDF	6971	Research Report	2, 1 hours
Elective		Selected in consultation with advisor	3 hours

OPTION II	Professional Enhancement (9 semester hours)	
Electives	Selected in consultation with advisor	9 hours
Total Minimum Semester Hours Required:		33

ELEMENTARY EDUCATION

a. Advanced Elementary Specialization (M.Ed.)

This program is designed to meet the needs of the classroom teacher whose career goal is to remain in the classroom. It provides experiences in the foundations of education, an update of the student's skills and understanding related to current research finding and instructional trends in basic subject matter areas, diagnosis and remediation in reading and mathematics, and an elective area permitting a selection of courses in a specific area, for example, reading or kindergarten education.

AREA A - CORE 12 Semester Hours

EDE	6971	Research Report	2,1 hours
EDF	6481	Fundamentals of Graduate Research in Education	3 hours

Choose one:

EDF	6155	Lifespan Human Development and Learning	3 hours
EDF	6517	History and Philosophy of American Education	3 hours
EDF	6608	Social Factors in American Education	3 hours

Choose one:

EDF	6401	Statistics for Educational Data	3 hours
EDF	6432	Measurement and Evaluation in Education	3 hours

AREA B - CURRICULUM 15 Semester Hours

LAE	6616	Trends in Language Arts Education	3 hours
MAE	6517	Diagnosis/Remediation of Difficulties in Mathematics for the Classroom Teacher	3 hours
RED	5514	Classroom Diagnosis and Development of Reading Proficiencies	3 hours
SCE	6616	Trends in Elementary School Science Education	3 hours
SSE	6617	Trends in Elementary School Social Studies Education	3 hours

AREA C - ELECTIVES 6 Semester Hours

EDE	5541	Individualizing Instruction in the Elementary School	3 hours
EDE	6205	Elementary School Curriculum	3 hours
EEX	5051	Exceptional Children in the Schools	3 hours
LAE	6714	Investigation in Children's Literature	3 hours
MAE	5637	Laboratory Programs in Mathematics	3 hours
MUE	5611	Trends in Elementary School Music Education	3 hours
RED	6116	Trends in Reading Education	3 hours

Total Minimum Semester Hours Required: 33

b. Early Childhood Specialization (M.Ed.)

The purpose of this program is to prepare students to become master teachers of, or consultants for, programs in nursery school through grade three. The program includes a "professional core" of research, human development, and measurement and evaluation courses; field experiences and courses focusing on programs, creative activities, organization of instruction, individualizing, perception and an overview of the exceptional student. This specialization fulfills Florida Early Childhood (nursery-kindergarten) certification requirements.

AREA A - CORE 12 Semester Hours

EDE	6971	Research Report	2,1 hours
EDF	6481	Fundamentals of Graduate Research in Education	3 hours
EDF	6155	Lifespan Human Development and Learning	3 hours
EDF	6401	Statistics for Educational Data	3 hours

or

EDF	6432	Measurement and Evaluation in Education	3 hours
AREA B - SPECIALIZATION			19 Semester Hours
EDE	5541	Individualizing Instruction in the Elementary School	3 hours
EEC	5205	Programs in Early Childhood Education	3 hours
EEC	5206	Organization of Instruction in Early Childhood Education	3 hours
EEC	5208	Creative Activities in Early Childhood	4 hours
EEX	5051	Exceptional Children in the Schools	3 hours
PET	6238C	Perceptual Motor Development	3 hours
AREA C - Alternate course at the 6000 level may be selected in consultation with an advisor.			3 Semester Hours
MAE	6517	Diagnosis/Remediation of Difficulties in Mathematics for the Classroom Teacher	3 hours
Total Minimum Semester Hours Required:			34

c. Mathematics Specialization (M.Ed.)

This is a program for elementary teachers who serve as special mathematics laboratory teachers; or as adjunct mathematics-learning disability teachers helping the regular classroom teacher in diagnosing, prescribing, and remediating the instruction of children identified as learning disabled in mathematics; or as mathematics specialists who are the curriculum resource instructional leaders in their school.

This program includes the development of competencies in diagnosing learning difficulties and error patterns in mathematics, organizing and managing laboratory experiences, using a wide variety of specific teaching techniques for all content strands in a K-8 (pre-algebra) mathematics classroom individualized instruction programs. The program may qualify one for certification in Elementary School and Junior High School Mathematics if he has sufficient mathematics (12 semester hours) content courses and certain experience-methods requirements.

AREA A - CORE			12 Semester Hours
EDF	6481	Fundamentals of Graduate Research in Education	3 hours
MAE	6971	Research Report	2.1 hours
Choose one:			
EDF	6155	Lifespan Human Development and Learning	3 hours
EDF	6517	History and Philosophy of American Education	3 hours
EDF	6608	Social Factors in American Education	3 hours
Choose one:			
EDF	6401	Statistics for Educational Data	3 hours
EDF	6432	Measurement and Evaluation in Education	3 hours
AREA B - SPECIALIZATION			12-15 Semester Hours
MAE	5637	Laboratory Programs in Mathematics	3 hours
MAE	6517	Diagnosis/Remediation of Difficulties in Mathematics for the Classroom Teacher	3 hours
MAE	6549	Practicum in Mathematics Instruction, K-12	1-3 hours
MAE	6899	Seminar in Teaching Mathematics	3 hours
AREA C - ELECTIVES			6-9 Semester Hours
MAE	5318	Current Methods in Elementary School Mathematics	3 hours
MAE	6145	Mathematics Curriculum, K-12	3 hours
MAE	6448	Designing Instructional Packages for Computer Applications	3 hours
MAE	6641	Problem Solving and Critical Thinking Skills in Mathematics, K-12	3 hours

COREQUISITES: Prescribed by College of Education to meet State Certification requirements or as support for degree program. An undergraduate course or in-service credit may be used to satisfy the requirement.

This program is not approved for automatic certification by the State of Florida. To be certified as an elementary mathematics specialist, a person must have a minimum of 12 semester hours in mathematics INCLUDING college algebra or higher mathematics.

Total Minimum Semester Hours Required:

33

**d. Elementary Education Specialization
Program for Certified Teachers (M.A.)**

A program for students previously certified as a Secondary Teacher or as a K-12 Teacher who wish to be certified in Elementary Education:

AREA A - PROFESSIONAL CORE 15 Semester Hours

EDE	6971	Research Report	2,1 hours
EDF	6481	Fundamentals of Graduate Research in Education	3 hours
MAE	6517	Diagnosis/Remediation of Difficulties in Mathematics for the Classroom Teacher	3 hours
RED	5147	Developmental Reading	3 hours
RED	5514	Classroom Diagnosis and Development of Reading Proficiencies	3 hours

AREA B - SPECIALIZATION 21 Semester Hours

ARE	4313	Art in the Elementary School	3 hours
HLP	4460	Teaching Elementary School Health and Physical Education	3 hours
LAE	6616	Trends in Language Arts Education	3 hours
LAE	6714	Investigation in Children's Literature	3 hours
MAE	5318	Current Methods in Elementary School Mathematics	3 hours
SCE	6616	Trends in Elementary School Science Education	3 hours
SSE	6617	Trends in Elementary School Social Studies Education	3 hours

COREQUISITES: Prescribed by College of Education to meet State requirements or as support for degree program. An undergraduate course or in-service credit may be used to satisfy the requirement.

MUE	3210	Music in the Elementary School	3 hours
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Choose one of the following if preparation is at the Secondary level:

EDE	5541	Individualizing Instruction in the Elementary School	3 hours
EDE	6205	Elementary School Curriculum	3 hours

Total Minimum Semester Hours Required:

36

Program for Non-Education Majors (M.A.)

A minimum requirement for this degree would be 36 hours. However, depending upon the student's background, the program could be extended to 59 hours. This program provides for professional and specialization preparation and certification in Elementary Education as shown below:

AREA A - PROFESSIONAL CORE

EDE	6971	Research Report	2,1 hours
EDF	6155	Lifespan Human Development and Learning	3 hours
EDF	6481	Fundamentals of Graduate Research in Education	3 hours
EDF	4324	Teaching in the Schools	3 hours
EDF	6517	History and Philosophy of American Education	3 hours
		or	
EDF	6608	Social Factors in American Education	3 hours
EDG	4324	Teaching in the Schools	3 hours

AREA B - SPECIALIZATION

LAE	4314	Language Arts in the Elementary School	3 hours
MAE	5318	Current Methods in Elementary School Mathematics	3 hours

SCE	6616	Trends in Elementary School Science Education	3 hours
SSE	6617	Trends in Elementary School Social Studies Education	3 hours
RED	5147	Developmental Reading	3 hours
RED	5514	Classroom Diagnosis and Development of Reading Proficiencies	3 hours
AREA C - INTERNSHIP			
EDG	6940	Graduate Internship (or equivalent)	3 hours
EDG	6940	Graduate Internship	7 hours
COREQUISITES			
ARE	4313	Art in the Elementary School	3 hours
EDE	4937	Drug Abuse Education	3 hours
EDG	4321	Teaching Strategies	4 hours
HLP	4460	Teaching Elementary School Health & Physical Education	3 hours
MUE	3210	Music in the Elementary School	3 hours
Total Minimum Semester Hours Required:			36

ENGLISH EDUCATION

a. English Language Arts (M.Ed.)

This program is designed to meet the advanced knowledge and skill needs of the English classroom teacher.

AREA A - CORE		12 Semester Hours
EDF	6481	Fundamentals of Graduate Research in Education 3 hours
ESE	6971	Research Report 2,1 hours
Choose one:		
EDF	6155	Lifespan Human Development and Learning 3 hours
EDF	6517	History and Philosophy of American Education 3 hours
EDF	6608	Social Factors in American Education 3 hours
Choose one:		
EDF	6401	Statistics for Educational Data 3 hours
EDF	6432	Measurement and Evaluation in Education 3 hours
AREA B - CURRICULUM		9 Semester Hours
Select from the following courses:		
LAE	4342	Teaching Language Composition 3 hours
LAE	5465	Literature for Adolescents 3 hours
LAE	6637	English Programs in the Secondary Schools 3 hours
EME	5208	Media and Methods 3 hours
ESE	6235	Curriculum Design 3 hours
AREA C - SPECIALIZATION		12 Semester Hours
Courses to be selected in consultation with the advisor.		
Total Minimum Semester Hours Required:		

33

b. English Language Arts (M.A.)

A program for non-education majors, or previously certified teachers in another field.

AREA A - PROFESSIONAL CORE		18 Semester Hours
EDF	6155	Lifespan Human Development and Learning 3 hours
EDF	6432	Measurement and Evaluation in Education 3 hours
EDF	6481	Fundamentals of Graduate Research in Education 3 hours
EDF	6517	History and Philosophy of American Education 3 hours
ESE	6235	Curriculum Design 3 hours
ESE	6971	Research Report 2,1 hours
AREA B - SPECIALIZATION		12 Semester Hours
Courses to be selected in consultation with an advisor. These hours must include a 5000- or 6000-level special methods course.		

AREA C - INTERNSHIP			10 Semester Hours
EDG	6940	Graduate Internship (or equivalent)	3 hours
EDG	6940	Graduate Internship	7 hours

COREQUISITES: Prescribed by College of Education to meet State Certification requirements or as support for degree program. An undergraduate course or in-service credit may be used to satisfy the requirement.

Total Minimum Semester Hours Required: 40

EXCEPTIONAL CHILD EDUCATION

Two master's degree programs are offered in Exceptional Child Education—the Master of Education (M.Ed.) and the Master of Arts Degree (M.A.).

The Master of Education M.Ed. degree provides for specialization in one of three areas:

- EH: Emotionally Handicapped (M.Ed.)** - Inability to achieve adequate academic progress or satisfactory interpersonal relationships not attributed primarily to physical, sensory or intellectual deficits.
- EMH: Educable Mentally Handicapped (M.Ed.)** - Significant impairment in general intellectual functioning concurrent with deficits in adaptive behavior which are manifested during the development period.
- SLD: Specific Learning Disability (M.Ed.)** - Disorder in one or more of the basic psychological processes involved in understanding or in using spoken and written language; learning problems not due primarily to other handicapping conditions.

Students who are not certified in Exceptional Education must take the following prerequisite courses before entering the master's program. A student who is interested only in certification will have to take a combination of graduate and undergraduate courses.

EEX	5051	Exceptional Children in the Schools	3 hours
EEX	3102	Language Development & Common Disorders	3 hours
EEX	3221	Assessment Exceptional Learners	3 hours
RED	5147	Developmental Reading	3 hours
MAE	5318	Current Methods in Elementary School Math	3 hours
One of the following specialization courses is required; the choice is dependent upon the student's area and the advisor's recommendation:			
EED	4011	Introduction to Teaching the Emotionally Disturbed	4 hours
EMR	4011	Introduction to Mental Retardation	4 hours
ELD	4011	Introduction to Specific Learning Disabilities	4 hours

a. Exceptional Child Education (M.Ed.)

This program is for those persons who have an undergraduate degree in Exceptional Education or who have an education background.

AREA A - CORE			12 Semester Hours
EDF	6481	Fundamentals of Graduate Research in Education	3 hours
EEX	6971	Research Report	2,1 hours
Choose one:			
EDF	6155	Lifespan Human Development & Learning	3 hours
EDF	6517	History & Philosophy of American Education	3 hours
EDF	6608	Social Factors in American Education	3 hours
Choose one:			
EDF	6401	Statistics for Educational Data	3 hours
EDF	6432	Measurement and Evaluation in Education	3 hours
AREA B - CURRICULUM CORE			18 Semester Hours
EEX	6612	Methods of Behavioral Management	3 hours
EEX	6107	Teaching Spoken and Written Language	3 hours
EEX	6342	Seminar - Critical Issues in Special Education	3 hours
EEX	6266	Curriculum Prescriptions for the Exceptional Population	3 hours
Choose one:			

EPH	5335	Physical and Sociological Implications of Handicapping Conditions	3 hours
EEX	6257	Exceptional Adolescents	3 hours
Choose one:			
EEX	6883	Clinical Practice or Restrictive Elective (See Advisor)	3 hours

AREA C - SPECIALIZATION. Choose one of the following. 3 Semester Hours

Choice will be dependent upon the student's specialty area.

ELD	6323	Theory & Application for Specific Learning Disabilities	3 hours
EMR	6205	Theory & Application for Educable Mentally Handicapped	3 hours
EED	6226	Theory & Application for Emotionally Handicapped	3 hours

Total Minimum Semester Hours Required: 33

b. Varying Exceptionalities (M.A.)

A program for non-education undergraduates. The varying exceptionalities option leads to certification (VE, SLD, MH, EH) and prepares graduates to teach in these areas of exceptionality. There are no prerequisites to admission but graduates must be certifiable by the completion of the degree program.

AREA A: CORE 9 Semester hours

EDF	6481	Fundamentals of Graduate Research in Education	3 hours
EDF	6401	Statistics for Educational Data	3 hours
EEX	6971	Thesis	2,1 hours*

AREA B - CURRICULUM CORE 24 Semester Hours

EEX	6107	Teaching Spoken and Written Language	3 hours
EEX	6266	Assessment and Curriculum Prescription	3 hours
EEX	6612	Methods of Behavior Management	3 hours
EEX	6342	Seminar: Critical Issues in Special Education	3 hours
EEX	6061	Instructional Strategies Pre-K to 6	3 hours
EEX	6065	Instructional Strategies 6-12	3 hours
EEX	6524	Organization and Collaboration in Special Education	3 hours
EEX	6940	Internship	3 hours
Minimum Semester Hours			36

*6 semester hours required if thesis option not selected.

Co-Requisites:

RED	5147	Developmental Reading	3 hours
MAE	5318	Current Methods of Elementary Math	3 hours
EDF	3603	Analysis of Educational Foundations	3 hours
EDF	4212	Classroom Learning Principles	3 hours
EDG	4321	Teaching Strategies in the Schools	3 hours

Students must demonstrate at least 6 semester hours of student teaching prior to graduation.

INSTRUCTIONAL TECHNOLOGY/EDUCATIONAL MEDIA

NOTE: The programs listed below are accredited by both NCATE (The National Council for the Accreditation of Teacher Education) and AECT (The Association for Educational Communications and Technology).

a. Educational Media (M.Ed.)

This program leads to a Master of Education degree and certification as a school media specialist. It is designed to offer skills in administration, production, instructional design, organization, selection, evaluation and research which relate to school media programs. It

stresses knowledge and applications of both present and future innovations and technologies for education.

The assumption is made within the Educational Media program that the applicant holds a teaching certificate currently valid in the State of Florida prior to entry into the program and at least one year of successful classroom experience.

AREA A - CORE

12 or 15 Semester Hours

Option 1 - 15 Semester Hours

EDF	6481	Fundamentals of Graduate Research in Education	3 hours
EDF	6155	Lifespan Human Development and Learning	3 hours
EME	6062	Research in I.T.	3 hours
		Elective	3 hours

Choose one:

EDF	6401	Statistics for Educational Data	3 hours
EDF	6432	Measurement and Evaluation in Education	3 hours

Option 2 - 12 Semester Hours

EDF	6481	Fundamentals of Graduate Research in Education	3 hours
EDF	6155	Lifespan Human Development and Learning	3 hours
EME	6971.02	Research Project - Planning	2 hours
EME	6971.11	Research Project - Application	1 hour

Choose one:

EDF	6401	Statistics for Educational Data	3 hours
EDF	6432	Measurement and Evaluation in Education	3 hours

AREA B - SPECIALIZATION

24 Semester Hours

EME	5208	Production Techniques for Instructional Settings	3 hours
EME	5051	Techniques of Instruction & Information Management	3 hours
EME	5225	Media for Children and Young Adults	3 hours
EME	6205	Role of the Media Specialist in Curriculum and Instruction	3 hours
EME	6805	Organization of Media and Information	3 hours
EME	6105	Collection Development Policies and Procedures	3 hours
EME	6807	Information Sources and Services	3 hours
EME	6706	Administrative Principles in Media Centers	3 hours

AREA C - ELECTIVES

3 Semester Hours

EME	6209	Advanced Production	3 hours
EME	6053	Current Trends in Instructional Technology	3 hours
EME	6403	Computer Assisted Instruction	3 hours
EME	6809	Informational Retrieval Systems	3 hours
EME	5408	Computer Applications in Instructional Technology	3 hours
EME	6613	Instructional Systems Design	3 hours
EME	6313	Media Systems Design	3 hours
LAE	5464	Literature for Adolescents	3 hours
LAE	6714	Investigation in Children's Literature	3 hours

INTERNSHIP - Required if no media center experience

EME	6946	Graduate Internship	3 hours
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Total Minimum Semester Hours Required: 39/42/45
(Depends on Option chosen and prior media center experience.)

b. Instructional Systems (M.A.)

This program leads to a Master of Arts degree and is designed for those who wish to work in business, industry, government, or other settings where training takes place. Instructional technologists analyze training problems and requirements; design, develop, evaluate, and manage instructional programs.

AREA A - CORE

6 or 9 hours

Option 1 - 6 Semester Hours

EDF	6481	Fundamentals of Graduate Research in Education	3 hours
EME	6971.02	Research Project - Planning	2 hours
EME	6971.11	Research Project - Finishing	1 hour
	or		

Option 2 - 9 Semester Hours

EDF	6481	Fundamentals of Graduate Research in Education	3 hours
EME	6062	Research in I.T.	3 hours
		Elective	3 hours

AREA B - SPECIALIZATION

EME	5056	Communication for I.S. - Process	3 hours
EME	5057	Communication for I.S. - Application	3 hours
EME	5054	I.S. Survey of Applications	3 hours
EME	5408	Computer Applications in I.T.	3 hours
EME	6613	Instructional Systems Design	3 hours
EME	6313	Media Systems Design	3 hours
EME	6705	Administration of Instructional Systems	3 hours
EME	6946	Graduate Internship in I.S.	3-9 hours*

*Only 3 hours count toward graduation

Electives

EME	6209	Advanced Production Techniques	9 hours
EME	6053	Current Trends in I.T.	3 hours
EME	6403	Computer Assisted Instruction	3 hours
EME	6809	Information Retrieval Systems	3 hours
EME	6455	Instructional Applications of Interactive Video	3 hours
INP	6317	Organizational Psychology and Motivation	3 hours
EIN	5255	Training Simulator Engineering	3 hours

Total Minimum Semester Hours Required: 39/42

MATHEMATICS EDUCATION**a. Mathematics Education (M.Ed.)**

This program is designed to meet the advanced knowledge and skill needs of the mathematics classroom teacher.

AREA A - CORE

12 Semester Hours

EDF	6481	Fundamentals of Graduate Research in Education	3 hours
ESE	6971	Research Report	2,1 hours

Choose one:

EDF	6155	Lifespan Human Development and Learning	3 hours
EDF	6517	History and Philosophy of American Education	3 hours
EDF	6608	Social Factors in American Education	3 hours

Choose one:

EDF	6401	Statistics for Educational Data	3 hours
EDF	6432	Measurement and Evaluation in Education	3 hours

AREA B - CURRICULUM

15 Semester Hours

MAE	5637	Laboratory Programs in Mathematics (required)	3 hours
MAE	6517	Diagnosis/Remediation of Difficulties in Mathematics for the Classroom Teacher (required)	3 hours
MAE	6899	Seminar in Teaching Mathematics (required)	3 hours

Select two courses from the following:

EME	5208	Production Techniques for Instructional Settings	3 hours
ESE	6218	Curriculum Writing	3 hours
MAE	6656	Using Technology in the Instruction of K-12 Mathematics	3 hours
MAE	6145	Mathematics Curriculum	3 hours
MAE	6549	Practicum in Mathematics Instruction, K-12	3 hours
MAE	6641	Problem Solving and Critical Thinking Skills in Mathematics, K-12	3 hours

AREA C - SPECIALIZATION

6 Semester Hours

Courses to be selected in consultation with an advisor.

Total Minimum Semester Hours Required:

33

b. Mathematics Education (M.A.)

Program for non-education majors or teachers previously certified in another field.

AREA A - PROFESSIONAL CORE			18 Semester Hours
EDF	6155	Lifespan Human Development and Learning	3 hours
EDF	6432	Measurement and Evaluation in Education	3 hours
EDF	6481	Fundamentals of Graduate Research in Education	3 hours
EDF	6517	History and Philosophy of American Education	3 hours
ESE	6235	Curriculum Design	3 hours
ESE	6971	Research Report	2,1 hours
AREA B - SPECIALIZATION			12 Semester Hours
Courses to be selected in consultation with an advisor. These hours must include a 5000- or 6000-level special methods course.			
AREA C - INTERNSHIP			10 Semester Hours
EDG	6940	Graduate Internship (or equivalent)	3 hours
EDG	6940	Graduate Internship	7 hours
COREQUISITES: Prescribed by College of Education to meet State Certification requirements or as support for degree program. An undergraduate course or in-service credit may be used to satisfy the requirement.			

Total Minimum Semester Hours Required: 40

MUSIC EDUCATION

Music Education (M.Ed.)

This program, offered in cooperation with the Department of Music, is for students who are certified to teach music (K-12). The Master of Education program, organized to increase knowledge and improve teaching skills, includes advanced work in research and educational foundations; a practicum in music education; and courses in foundations of music education, general music, teaching performance and curriculum. Advanced courses in music history, music theory, conducting and performance are included.

AREA A - CORE			12 Semester Hours
EDF	6481	Fundamentals of Graduate Research in Education	3 hours
MUE	6971	Research Report	2,1 hours
Choose one:			
EDF	6155	Lifespan Human Development and Learning	3 hours
EDF	6517	History and Philosophy of American Education	3 hours
EDF	6608	Social Factors in American Education	3 hours
Choose one:			
EDF	6401	Statistics for Educational Data	3 hours
EDF	6432	Measurement and Evaluation in Education	3 hours
AREA B - CURRICULUM			12 Semester Hours
MUE	6155	Teaching Performance	3 hours
MUE	6349	Advanced General Music	3 hours
MUE	6946	Practicum in Music Education	3 hours
MUE		Directed Elective	3 hours
AREA C - SPECIALIZATION			9 Semester Hours
MUG	4102	Advanced Conducting	1 hours
MUH	4340	Seminar: "Period" Course in Music History	3 hours
MUT	5325	Arranging and Composing Music	3 hours
*MV	5251	Applied Music Principal or Secondary	(1,1)

*Full prefix will be determined by the instrument on which student performs, i.e., MVK signifies piano/organ.

MUSIC PLACEMENT EXAMINATION

A placement examination in music history, music theory, and sight singing (or completion of equivalent courses below) is required.

MUH	4218	Review of Music History	1 hour
MUT	4031	Review of Music Theory	1 hour

MUT	4275	Review of Sight-Singing and Ear Training	2 hours
Total Minimum Semester Hours Required:			33

Graduate performance and advanced conducting courses available only after admission to the graduate program and successful completion of 9 semester hours of the graduate program.

MUSIC EDUCATION (M.A.)

This program is offered for students who have completed a baccalaureate degree who seek certification in music (K-12). The Master of Arts program is organized to develop basic teaching skills as well as advanced work in research and educational foundations; courses in foundations of music education and methods of teaching music. Supervised internship experiences are included. In most cases, music specialization requirements for certification are met by the B.A. degree.

AREA A - CORE			16 Semester Hours
EDF	6481	Fund. Grad Res in Ed	3 hours
EDF	65617	Hist Phil Am Educ OR EDF 6608 Soc Fac	3 hours
EDF	6155	Life Span Hum Dev	3 hours
EDG	4321	Teaching Strategies	4 hours
MUE	6918	Res Project Planning, Completion	2,1 hours
AREA B - SPECIALIZATION			11 Semester Hours
MUE	4330	Elem Instruc Analysis	2 hours
MUE	6349	Adv Gen Music	3 hours
MUE	6155	Teacing Perf. Org.	3 hours
MUE		Directed Elective	3 hours
AREA C - INTERNSHIP			10 Semester Hours
MUE	6940	Grad Internship (or equivalent)	3 hours
MUE	6940	Grad Internship	7 hours

Total Minimum Semester Hours Required: 37



MUSIC PLACEMENT EXAMINATION

A placement examination in music history, music theory, and sight singing (or completion of equivalent courses below) is required.

MUH	4218	Review of Music History	1 hour
MUH	4031	Review of Music History	1 hour
MUT	4275	Review of Sight-Singing and Ear Training	hours

Total Minimum Semester Hours Required: 33

Graduate performance and advanced conducting courses available only after admission to the graduate program and successful completion of 9 semester hours of the graduate program.

PHYSICAL EDUCATION

The Physical Education program offers a Master of Education degree (M.Ed.) and a Master of Arts degree (M.A.) with specializations in various aspects of physical education.

The M.Ed. degree is sufficiently flexible to meet a range of student needs in improving proficiency and competencies in teaching, curriculum, research design, administrative techniques and physical education for exceptional students. The degree provides for three separate options: The Adapted Physical Education option seeks to train qualified adapted physical education specialists, to serve special education students in regular classrooms. The Master Teacher option is designed to prepare master teachers for all students grades 6-12. The Perceptual Motor Development option focuses on the preparation of physical education teachers to work with exceptional children in the 0-9 age group.

a. Adapted Physical Education Option (M.Ed.)

AREA A - PROFESSIONAL CORE			12 Semester Hours
EDF	6481	Fundamentals of Graduate Research in Education	3 hours
EDF	6401	Statistics for Educational Data	3 hours
PET	6971	Research Report	2,1 hours
PET	6946	Practicum	3 hours
AREA B - SPECIALIZATION			21 Semester Hours
PET	6647	Program Dev. in Adapted P.E.	3 hours
PET	6615	Psychomotor Assessment of Exceptional Children	2 hours
PET	6645	Advanced Studies in Adapted P.E.	3 hours
PET	6646	Methods & Curriculum in Adapted P.E.	4 hours
PET	6655	Developmental Aspects of Motor Disabilities	3 hours
EEX	5051	Exceptional Children in Schools	3 hours
EEX	6612	Behavior Management	3 hours
NON-THESIS OPTION			6 Semester Hours
PET	6238C	Perceptual Motor Development	3 hours
2nd course to be determined in consultation between student and advisor.			3 hours

Total Minimum Semester Hours Required: 33

b. Master Teacher Option (M.Ed.)

AREA A - PROFESSIONAL CORE			12 Semester Hours
EDF	6481	Fundamentals of Grad. Research	3 hours
EDF	6401	Statistics for Ed. Data	3 hours
PET	6432	Measurement and Evaluation	3 hours
PET	6971	Thesis	2,1 hours
AREA B - SPECIALIZATION			21 Semester Hours
EEX	5051	Ex. Child in Schools	3 hours
PET	6615	Psychomotor Assessment of Exceptional Children	2 hours
PET	6646	Methods and Curriculum in Adapted P.E.	4 hours
PET	6655	Developmental Aspects of Motor Disabilities	3 hours
PET	6910	Problem and Review of Lit.	3 hours

PET	6425	Curriculum Trends & Phil. Found. in P.E.	3 hours
NON-THESIS OPTION			6 Semester Hours
PET	6386C	Environmental Ex. Physiol.	3 hours
PET	6238C	Perceptual Motor Development	3 hours

Total Minimum Semester Hours Required: 33

c. Perceptual Motor Development Option (M.Ed.)

AREA A - PROFESSIONAL CORE			12 Semester Hours
EDF	6481	Fundamentals of Grad. Research	3 hours
EDF	6155	Lifespan Human Dev. and Learning	3 hours
EDF	6401	Statistics for Educational Data	3 hours
EDF	6971	Thesis	2,1 hours
AREA B - SPECIALIZATION			21 Semester Hours
PET	6946	Practicum	3 hours
EEX	5051	Exceptional Children in the Schools	3 hours
PET	6615	Psychomotor Assessment of Exceptional Children	2 hours
PET	6646	Methods & Curriculum in Adapted P.E.	4 hours
PET	6655	Developmental Aspects of Motor Disabilities	3 hours
PET	6238C	Perceptual Motor Development	3 hours
PET	6910	Problem Analysis Review of Lit.	3 hours



NON-THESIS OPTION			6 Semester Hours
PET	6xxx	Wellness Dev. for Children	3 hours
PET	6645	Advanced Studies in Adapted P.E.	3 hours
Total Minimum Semester Hours Required:			33

d. Wellness Management Option (M.A.)

AREA A - CORE			9 Semester Hours
EDF	6481	Fund.of Grad.Research in Education	3 hours
PET	6910	Problem Analysis—Review of Literature	3 hours
PET	6946	Internship/Practicum	3 hours
PET	6971		3 hours
AREA B - PROFESSIONAL PRACTICE			24 Semester Hours
PET	6386C	Environmental Exercise Physiology	3 hours
PET	6377	Physiology of Neuro. Mec.	3 hours
PET	6367	Physical Performance & Energy Supplies	3 hours
PET	6416	Administration of Corporative Wellness	3 hours
PET	6086	Ex. Intervention & Risk Hazards	3 hours
PET	6085	Ex. Lifestyles—Adherence & Compliance	3 hours
EDF	6401	Statistics for Educational Data	3 hours

COREQUISITES: Depending on the background and experiences of the student, certain co-requisites may be required.

Total Minimum Semester Hours Required: 33

READING EDUCATION

Reading, K-12 (M.Ed.)

This program prepares teachers for certification as reading specialists (e.g., reading resource teacher, reading laboratory teacher, reading/language arts supervisor, primary education specialist) in grades K-12 in public schools and private reading laboratories or clinics. Diagnosis of reading disabilities, techniques of corrective reading, psychological measurement, reading in the content fields, management of reading programs, reading trends and research and dimensions of the language arts other than reading are included with considerable emphasis on practicums with disabled readers from the early childhood to adult levels. People certified in areas of education other than elementary are eligible to pursue a degree in the program.

AREA A - CORE			12 Semester Hours
EDF	6481	Fundamentals of Graduate Research in Education	3 hours
RED	6971	Research Report	2,1 hours
Choose one:			
EDF	6155	Lifespan Human Development and Learning	3 hours
EDF	6517	History and Philosophy of American Education	3 hours
EDF	6608	Social Factors in American Education	3 hours
Choose one:			
EDF	6432	Measurement & Evaluation in Education (Required for Certification)	3 hours
EDF	6401	Statistics for Educational Data	3 hours
AREA B - SPECIALIZATION			21 Semester Hours
RED	6337	Reading in the Secondary School	3 hours
RED	6116	Trends in Reading Education	3 hours
RED	6336	Reading in the Content Areas	3 hours
RED	6746	Management of Reading Programs	3 hours
RED	6845	Clinical Diagnosis and Remediation of Reading Difficulties	3 hours
RED	6846	Clinical Reading Practicum	6 hours

PREREQUISITES: Prescribed by College of Education to meet State Certification requirements or as support for degree program.

RED	5147		
	(or 3012)	Developmental Reading	3 hours
RED	5514		
	(or 4519)	Classroom Diagnosis and Development of Reading Proficiencies	3 hours
LAE	3414	Literature for Children	
	(or 5465)	Literature for Adolescents)	3 hours
LAE	4314	Language Arts in the Elementary School	
	(or 4342)	Teaching Language and Composition)	3 hours

Total Minimum Semester Hours Required: 33

SCIENCE EDUCATION

a. Science Education (M.Ed.)

This program is designed to meet the advanced knowledge and skill needs of the science classroom teacher.

AREA A - CORE		12 Semester Hours
EDF	6481	Fundamentals of Graduate Research in Education 3 hours
ESE	6971	Research Report 2,1 hours
Choose one:		
EDF	6155	Lifespan Human Development and Learning 3 hours
EDF	6517	History and Philosophy of American Education 3 hours
EDF	6608	Social Factors in American Education 3 hours
Choose one:		
EDF	6401	Statistics for Educational Data 3 hours
EDF	6432	Measurement and Evaluation in Education 3 hours
AREA B - CURRICULUM		12 Semester Hours
SCE	5238	Inquiry in the Sciences 3 hours
SCE	6237	Science Programs in Secondary School 3 hours
Electives - Select in consultation with advisor		6 hours
AREA C - SPECIALIZATION		9 Semester Hours
Courses to be selected in consultation with the advisor.		

Total Minimum Semester Hours Required: 33

b. Science Education (M.A.)

Program for non-education majors, or previously certified teachers in another field.

AREA A - PROFESSIONAL CORE		18 Semester Hours
EDF	6155	Lifespan Human Development and Learning 3 hours
EDF	6432	Measurement and Evaluation in Education 3 hours
EDF	6481	Fundamentals of Graduate Research in Education 3 hours
EDF	6517	History and Philosophy of American Education 3 hours
ESE	6235	Curriculum Design 3 hours
ESE	6971	Research Report 2,1 hours
AREA B - SPECIALIZATION		12 Semester Hours
Courses to be selected in consultation with an advisor. These hours must include a 5000- or 6000-level special methods course.		
AREA C - INTERNSHIP		10 Semester Hours
EDG	6940	Graduate Internship (or equivalent) 3 hours
EDG	6940	Graduate Internship 7 hours

COREQUISITES: Prescribed by College of Education to meet State Certification requirements or as support for degree program. An undergraduate course or in-service credit may be used to satisfy the requirement.

Total Minimum Semester Hours Required: 40

SOCIAL SCIENCE EDUCATION

a. Social Science Education (M.Ed.)

This program is designed to meet advanced knowledge and skill needs of the social science classroom teacher.

AREA A - CORE			12 Semester Hours
EDF	6481	Fundamentals of Graduate Research in Education	3 hours
ESE	6971	Research Report	2,1 hours
Choose one:			
EDF	6155	Lifespan Human Development and Learning	3 hours
EDF	6517	History and Philosophy of American Education	3 hours
EDF	6608	Social Factors in American Education	3 hours
Choose one:			
EDF	6401	Statistics for Educational Data	3 hours
EDF	6432	Measurement and Evaluation in Education	3 hours
AREA B - CURRICULUM			12 Semester Hours
ESE	6235	Curriculum Design	3 hours
ESE	6325	Curriculum Theory	3 hours
SSE	4334	Advanced Inquiry in the Social Studies	3 hours
SSE	6636	Contemporary Social Science Education	3 hours
AREA C - SPECIALIZATION			9 Semester Hours
Courses to be selected in consultation with the advisor.			
Total Minimum Semester Hours Required:			33

b. Social Science Education (M.A.)

Program for non-education majors or previously certified teachers in another field.

AREA A - PROFESSIONAL CORE			18 Semester Hours
EDF	6155	Lifespan Human Development and Learning	3 hours
EDF	6432	Measurement and Evaluation in Education	3 hours
EDF	6481	Fundamentals of Graduate Research in Education	3 hours
EDF	6517	History and Philosophy of American Education	3 hours
ESE	6235	Curriculum Design	3 hours
ESE	6971	Research Report	2,1 hours
AREA B - SPECIALIZATION			12 Semester Hours
Courses to be selected in consultation with an advisor. These hours must include a 5000- or 6000-level special methods course.			
AREA C - INTERNSHIP			10 Semester Hours
EDG	6940	Graduate Internship (or equivalent)	3 hours
EDG	6940	Graduate Internship	7 hours
COREQUISITES: Prescribed by College of Education to meet State Certification requirements or as support for degree program. An undergraduate course or in-service credit may be used to satisfy the requirement.			
Total Minimum Semester Hours Required:			40

VOCATIONAL EDUCATION

Two types of degrees are available in Vocational Education. The Master of Education degree is designed to meet the needs of students who have a baccalaureate degree and who have completed course work for regular vocational Florida State Teaching Certification. This degree requires a minimum of 33 semester hours.

The Master of Arts degree is designed for the student who has a baccalaureate degree in a discipline other than education. This degree requires a minimum of 39 semester hours.

a. Administrator Option (M.Ed.)

AREA A - CORE			12 Semester Hours
EDF	6481	Fundamentals of Graduate Research in Education	3 hours
Choose one:			
EDF	6608	Social Factors in American Education	3 hours
EDF	6155	Lifespan Human Development and Learning	3 hours
EDF	6517	History and Philosophy of American Education	3 hours
Choose one:			
EDF	6401	Statistics for Educational Data	3 hours
EDF	6432	Measurement and Evaluation in Education	3 hours
Choose one:			
EDG	6940	Graduate Internship	3 hours
EVT	6971	Research Report	2,1 hours
AREA B - SPECIALIZATION			21 Semester Hours
Courses to be selected in consultation with the advisor.			
EDA	6232	Legal Aspects of School Operation	3 hours
EVT	6264	Administration in Vocational Education	3 hours
EVT	6265	Supervision in Vocational Education	3 hours
EVT	6664	School/Community Relations for Vocational Education	3 hours
COREQUISITES: Prescribed by College of Education to meet State Certification requirements or as support for degree program.			
EVT	4065	Principles and Practices of Vocational Education	3 hours
RED	6336	Reading in the Content Areas	3 hours
An undergraduate or in-service credit may be used to satisfy the requirement.			
Total Minimum Semester Hours Required:			33

b. Master Teacher Option (M.Ed.)

AREA A - CORE			12 Semester Hours
EDF	6481	Fundamentals of Graduate Research in Education	3 hours
Choose one:			
EDF	6155	Lifespan Human Development and Learning	3 hours
EDF	6517	History and Philosophy of American Education	3 hours
EDF	6608	Social Factors in American Education	3 hours
Choose one:			
EDF	6401	Statistics for Educational Data	3 hours
EDF	6432	Measurement and Evaluation in Education	3 hours
Choose one:			
EDG	6940	Graduate Internship	3 hours
EVT	6971	Research Report	2,1 hours
AREA B - SPECIALIZATION			21 Semester Hours
Courses to be selected in consultation with the advisor.			
COREQUISITE			
EVT	4065	Principles and Practices of Vocational Education	3 hours
Total Minimum Semester Hours Required:			33

c. General Vocational Option (M.A.)

AREA A - CORE			9-13 Semester Hours
EDF	6481	Fundamentals of Graduate Research in Education	3 hours
Choose one:			
EDF	6155	Lifespan Human Development and Learning	3 hours
EDG	6517	History and Philosophy of American Education	3 hours
EDF	6608	Social Factors in American Education	3 hours
Choose one:			
EDG	6940	Graduate Internship	3-7 hours
EVT	6971	Research Report	2,1 hours

AREA B - SPECIALIZATION			30 Semester Hours
EVT	4065	Principles and Practices of Vocational Education	2-4 hours
EVT	4368	Advanced Teaching Techniques for Vocational Education	2-4 hours
EVT	5561	Student Guidance in the Vocational Program	2-3 hours
EVT	5564	Student Vocational Organizations	2-3 hours
EVT	6664	School/Community Relations for Vocational Education	2-4 hours
Other education courses at the 6000 level must be selected in consultation with an advisor.			8-18 hours
Total Minimum Semester Hours Required:			39-43

d. Health Related Option (M.A.)

AREA A - CORE			9 Semester Hours
EDF	6481	Fundamentals of Graduate Research in Education	3 hours
Choose one:			
EDF	6155	Lifespan Human Development and Learning	3 hours
EDF	6517	History and Philosophy of American Education	3 hours
EDF	6608	Social Factors in American Education	3 hours

Choose one:

EDG	6940	Graduate Internship	3-7 hours
EVT	6971	Research Report	2,1 hours

AREA B - SPECIALIZATION			19-23 Semester Hours
EVT	4065	Principles and Practices of Vocational Education	3 hours
EVT	4368	Advanced Teaching Techniques for Vocational Education	3 hours
EVT	5315	Applied Clinical Teaching Techniques in Vocational Education	3 hours
EVT	5316	Clinical Coordination for the Health Occupations Teacher	3 hours
EVT	6265	Supervision in Vocational Education	3 hours
EVT	6664	School/Community Relations for Vocational Education	2-4 hours

AREA C - ELECTIVES			7-11 Semester Hours
Courses must be at the 6000 level and selected in consultation with an advisor.			

Total Minimum Semester Hours Required: 39

EDUCATIONAL SPECIALIST DEGREE PROGRAMS

Educational Specialist (Ed.S.) degree programs are offered in three areas: Curriculum/Instruction, designed for persons in teaching and other instruction/training leadership positions; Educational Leadership, for students who are interested in decision-making positions in educational organizations; and School Psychology, a special degree program that does not require a master's degree for admission but does have other special admission criteria.

CURRICULUM/INSTRUCTION AND EDUCATIONAL LEADERSHIP

Admissions Policy

Admissions will occur two times a year, Fall and Spring. Completed files must be on campus by September 15 for Spring admission screening and February 15 for Summer/Fall admission screening. Admitted students may begin course work during the first new semester after admission.

Completed files include: 1) completed UCF Graduate School application form, 2) transcripts from all post-secondary schools previously attended, 3) GRE scores, 4) three letters

of recommendation, 5) professional resume, 6) statement of professional goals, 7) other information that may be requested after the file is started.

Additional Information

Admission to an Educational Specialist Degree Program is separate from admission to the Doctoral Program. Upon completion of the Specialist Degree, the candidate may apply for admission to the Ed.D. degree program.

Specialist Admission Requirements

1. A master's degree from an accredited institution;
AND
2. A combined score of 1000 or above on the General Graduate Record Examination (verbal/quantitative scores combined);
AND
3. Recommended for admission by the appropriate major program committee.

NOTE: Those applicants who do not meet admission criteria may appeal to the College of Education Graduate Standards and Curriculum Committee for consideration. A second GRE score of 900 or above is required for review by this committee.

Degree Requirements

1. Complete a minimum of 36 semester hours beyond the Master's Degree including the selected program requirements.
2. Have an overall 3.0 GPA on all graduate work attempted.
3. The completed planned program must include a minimum of 12 graduate-level hours in the specialization area AND a minimum of 6 graduate-level hours in Research/Statistics.
4. Pass all required examinations.

Transfer Credit

Total transfer credit may not exceed 9 semester hours. All credit must be earned after the Master's Degree with the maximum being 9 semester hours from other institutions within the State University System (SUS) or a maximum of 6 semester hours earned at institutions not in the SUS but which are fully accredited.

Post-master's degree work taken at UCF prior to admission to the program is considered to be transfer credit.

Required Examinations

Educational Leadership majors must successfully complete one 5-hour examination in general educational administration and supervision.

Curriculum and Instruction majors must successfully complete one 3-hour examination in Curriculum and Instruction and one 3-hour examination in their area of specialization.

Time Limits

Course credit hours counted toward a degree may be no more than seven years old by the time the degree requirements are completed.

Continuous Attendance

Students may not be guaranteed continuing graduate status if they do not enroll in the University for a period of three consecutive semesters INCLUDING Summer.

Graduation policy allows students to fulfill degree requirements as listed in the UCF Catalog in force during the student's most recent period of attendance. Because students must occasionally interrupt their attendance for a brief period, they will be considered to have interrupted their attendance only if the interruption is for three or more consecutive terms, including Summer. Under these circumstances, students will lose the option of fulfilling degree requirements under earlier catalogs.

SCHOOL PSYCHOLOGY

The Educational Specialist degree program in School Psychology is a unique specialization in psychology and education. This program is based on the assumptions that school psychologists can apply relevant knowledge and skills from a variety of disciplines to the learning and adjustment problems of preschool and school-age children; and that relevant knowledge and skills can be transmitted through a variety of services including (a) consultation with teachers and parents, (b) direct services to children and young adults, and (c) indirect services to school and community organizations. School psychologists may practice in public or private schools, colleges and universities, rehabilitation centers, hospitals, mental health clinics, government agencies, child guidance centers, penal institutions, and may develop private practices. Applicants with backgrounds in education, psychology or other undergraduate majors may qualify. The program involves formal preparation and practical experiences focusing on psychological foundations (human development, learning and motivation), psycho-educational assessment, exceptional students, remediation or intervention techniques, counseling skills, as well as full-time supervised internship of two semesters in the public school setting. Graduates are certifiable at the state level.

Other criteria: Applicants for the School Psychology program are required to attend a formal interview. This program can accommodate only a limited number of students; therefore, there is a possibility of being denied admission even when all criteria are met.

Admissions to this program will occur only in the Fall term. Information concerning specific admissions policy and procedures can be obtained from the contact person listed below.

AREA A - CORE			21 Semester Hours
EEX	5051	Exceptional Children in the Schools	3 hours
RED	6336	Reading in the Content Area	3 hours
DEP	5057	Developmental Psychology	3 hours
EXP	5445	Psychology of Learning and Motivation	3 hours
EAB	5765	Applied Behavior Analysis with Children and Youth	3 hours
EDF	6401	Statistics for Educational Data	3 hours
EDF	6481	Fundamentals of Graduate Research in Education	3 hours
AREA B - SPECIALIZATION			45 Semester Hours
SPS	6601	Introduction to Psychological Services in Schools	3 hours
SPS	6608	Seminar in School Psychology	3 hours
EGC	6435	Theories of Individual Counseling	3 hours
EGC	6436	Techniques of Counseling	3 hours
EGC	6505	Group Procedures and Theories in Counseling	3 hours
SPS	6191	Psycho-Educational Diagnosis I	3 hours
SPS	6192	Psycho-Educational Diagnosis II	3 hours
SPS	6606	School Consultation Techniques	3 hours
SPS	6175	Multicultural Issues and Assessment	2 hours
SPS	6125	Infant Developmental Assessment	2 hours
SPS	6946	Practicum in School Psychology I	1 hour
SPS	6946	Practicum in School Psychology II	1 hour
SPS	6973	Thesis: Specialist (Planning Phase)	2 hours
SPS	6973	Thesis: Specialist (Finishing Phase)	1 hour
SPS	6949	School Psychology Internship	12 hours
Pre- or Corequisites			
EDA	6061	Organization and Administration of Schools	3 hours
EDF	6517	History & Philosophy of American Education	3 hours
		or	
EDF	6608	Social Factors in American Education	3 hours
		One other course in administration/supervision, curriculum or general methods.	3 hours

Total Minimum Semester Hours Required:

66

DOCTOR OF EDUCATION DEGREE PROGRAMS

Doctor of Education (Ed.D.) degree programs are offered in two areas. One is Educational Leadership for students who are interested in management and leadership positions in educational organizations. The second is Curriculum and Instruction, designed for those interested in teaching in a college of education, teaching a content field at the community college level, becoming a school district leader in curriculum and instruction, or performing instructional design tasks in military or business settings.

Admission Policy

Admissions will occur two times a year, Fall and Spring. Completed files must be on campus by September 15 for Spring admission screening and February 15 for Summer/Fall admission screening. Admitted students may begin course work during the first new semester after admission.

Completed files include: 1) completed UCF Graduate School application form, 2) transcripts from all post-secondary schools previously attended, 3) GRE scores, 4) three letters of recommendation, 5) professional resume, 6) statement of professional goals, 7) other information that may be requested after the file is started.

Students interested in financial support through fellowship programs must have completed application files by December 15. The fellowships would be awarded for students enrolling for the first time in the Fall Semester of the next academic year. Graduate assistantships may be granted for those who apply by February 15.

Admission Requirements

1. Undergraduate GPA on the last 60 semesters hours of 3.0 (on a 4.0 scale);
AND
2. A master's degree from an accredited institution;
AND
3. Minimum score of 1000 on the General Graduate Record Examination (verbal/
quantitative scores combined);
AND
4. Recommended for admission by the appropriate major program area committee;
AND
5. Completion of at least three years of full-time teaching or comparable experience.

NOTE: Those applicants who do not meet admission criteria may appeal to the College of Education Graduate Standards and Curriculum Committee for consideration. For those who do not meet the GRE requirement, a second score is required, and one of the two scores must be 940 or higher for consideration for provisional admission.

Degree Requirements for Curriculum/Instruction

1. Prerequisites
(ESE 6235, EDF 6481, EDF 6401, or Equiv.) 9 semester hours
2. Curriculum/Instruction Core
(EDF 6232, EDG 7221, EDG 7356, EDG 7692) 13 semester hours
3. Specialization Area Minimum 45 semester hours
(includes selected courses in Teaching Field or Cognate, Instruction, Foundations,
and Educational Leadership)
4. Research and Data Analysis (EDF 7403, EDF 7463) 6 semester hours
5. Dissertation Minimum 18 semester hours
6. Pass all required examinations and successfully defend dissertation.
7. Have an overall 3.0 GPA on all graduate work included in the planned program.

Degree Requirements for Educational Leadership

1. Prerequisite Courses (as necessary)
2. Educational Leadership Core Courses 16 semester hours
3. Cognate Courses Minimum 6 semester hours
4. Area of Specialization Minimum 16 semester hours
5. Research and Data Analysis Minimum 12 semester hours
6. Dissertation Minimum 20 semester hours

7. Pass all examinations and successfully defend dissertation.
8. Have an overall 3.0 GPA on all graduate work attempted.

Transfer Credit

The number of transfer credit hours applied to the course requirements for a doctoral degree may not exceed 30 semester hours. Transfer credit will include graduate hours awarded by an accredited institution toward a master's degree and post-master's degree work. The transfer credit allowed will be determined on a case by case basis by the graduate advisor and program coordinator.

Post-Master's degree credit taken at UCF prior to admission to the program is considered to be transfer credit.

Candidacy Examinations

1. Examinations are normally taken no sooner than the last semester of the student's course work and must be completed prior to admission to candidacy. (The exception is for C & I students who take a qualifying examination after completing the C & I core courses.)
2. Examinations will be scheduled near the tenth week of the Fall and Spring Semesters. Examinations in the Summer Term must be arranged by the student with the coordinator of the respective program.
3. All doctoral candidates will be required to write in three areas; these are:
 - a. Curriculum and Instruction

Specialization/Teaching Field	5-hour examination
Curriculum/Instruction	3-hour examination
Research/Data Analysis	3-hour examination
 - b. Educational Leadership

General Administration/Supervision	5-hour examination
Area of Specialization	3-hour examination
Research/Data Analysis	3-hour examination
4. Students must be enrolled in the University during the semester an examination is taken.

Continuous Attendance

Graduation policy allows students to fulfill degree requirements as listed in the UCF Catalog in force during the student's most recent period of continuous attendance. Because students must occasionally interrupt their attendance for a brief period, they will be considered to have interrupted their attendance only if the interruption is for three or more consecutive terms, including Summer. Under these circumstances, students will lose the option of fulfilling degree requirements under earlier catalogs. To avoid problems associated with maintaining graduate status, doctoral students are encouraged to enroll each semester, including summers.

Residency Requirement

Each student shall complete two contiguous semesters in full-time graduate student status. "Full-time" is defined as a minimum of nine hours per semester.

Admission to Candidacy

Before students can enroll in dissertation hours, they must apply for admission to candidacy. To be eligible for candidacy, students must have completed all degree course requirements, passed all candidacy examinations, and successfully defended the dissertation proposal.

Status as a Candidate

1. Enrollment

Students must continue to enroll for at least one semester hour of dissertation credit each semester after attaining candidacy status until the oral defense of the dissertation has been successful. Post-candidacy enrollment is allowed for a maximum of four years, subject to the seven-year time limitation.

2. Time Limitation

A student has seven years from the date of admission to the doctoral program to complete the dissertation. If the seven-year limit is exceeded, the candidacy examinations must be repeated.

3. Dissertation Committee Composition

A committee, which will consist of a minimum of four faculty members (three from the College of Education and one from outside the college), must be approved by the Dean of the College of Education and the Provost.

4. Dissertation

Dissertations are required in all doctoral programs. College of Education candidates will follow the APA (American Psychological Association) guidelines.

List of Courses — College of Education

ARE 5251 Art for Exceptionalities

3 cr (2,1)

Concepts, principles, and methods of integrating art processes into the education of the physically, emotionally, and mentally handicapped.

ARE 5255 Art in Recreation

3 cr (2,1)

Art activities and experiences appropriate for use in playground, leisure services, occupational orientation, and other recreational areas.

ARE 5358 Found Arts

3 cr (3,0)

PR: ARE 4440 and ARE 4443 or C.I. Materials available for instruction in the public schools will be explored in depth in relation to their appropriateness and productive qualities.

ARE 5444 Jewelry Making in Schools

3 cr (3,0)

PR: C.I. Jewelry making appropriate for school age children using standard public school equipment.

ARE 5648 Contemporary Visual Arts Education

3 cr (3,0)

PR: ARE 4443 or C.I. Continued study of current programs and innovations in public school Visual Arts Programs.

ARE 6455 K-12 Art Instructional Materials I

3 cr (3,0)

Advanced application of two-dimensional, three-dimensional, and graphics materials to appropriate levels of instruction in elementary and secondary schools.

ARE 6456 K-12 Art Instructional Materials II

3 cr (3,0)

Continuation of ARE 6455.

ARH—See College of Arts & Sciences, Department of Art

ART 5109C Crafts Design

3 cr (2,1)

Crafts design and production, including the use of rigid, flexible, and linear materials.

BTE 6171 Business Education Curriculum

3 cr (3,0)

PR: Basic Teacher Certificate or C.I. Curriculum planning and development; objectives, innovations, problems and issues in contemporary business programs.

BTE 6425 Advanced Business Instruction Techniques

3 cr (3,0)

PR: Graduate standing or C.I. Research, methods and materials related to current practices in Business Education.

BTE 6426 Office Simulation Techniques

3 cr (3,4)

PR: Basic Teacher Certificate or C.I. Methods of office simulation for teachers at the developmental and performance levels.

BTE 6935 Seminar in Business Education

3 cr (3,0)

PR: Graduate Standing or C.I. Current problems, issues and trends in Business Education.

BTE 6946 Practicum Business Education

3 cr (3,0)

PR: Graduate Standing. Techniques, materials and instructional media; evaluation and new trends of instruction in all areas of Business Education.

- CAP 6613 Utilizing Microcomputers in Education** **3 cr (0)**
Instruction in microcomputers emphasizing applications of software in the classroom and for school record keeping.
- CLP 5004 Psychology of Adult Adjustment - See College of Arts and Sciences, Department of Psychology**
- CLP 5166 Advanced Abnormal Psychology - See College of Arts and Sciences, Department of Psychology**
- DEP 5057 Developmental Psychology - See College of Arts and Sciences, Department of Psychology**
- EAB 5765 Applied Behavior Analysis with Children and Youth - See College of Arts and Sciences, Department of Psychology**
- EDA 6061 Organization and Administration of Schools** **3 cr (3,0)**
PR: Basic Teacher Certificate or C.I. Introduction to and overview of educational administration including governance, finance communications and information management, personnel evaluation.
- EDA 6106 Trends in Educational Administration** **3 cr (3,0)**
PR: Master's degree and/or Rank II certification including a course in school organization. Exemplary organization patterns in school administration will be examined. Study of patterns of functions in selected outstanding school organizations.
- EDA 6201 Educational Business Management Systems** **3 cr (3,0)**
PR: Master's degree and a graduate course in school finance and business administration. Identification and study of exemplary management procedures and systems in education.
- EDA 6222 Administration of Educational Personnel and Contracts** **3 cr (3,0)**
PR: Master's degree and/or Rank II certification, including a course in educational law. Study of educational settings in which administrators deal with contracts and legal dimensions of instructional, technical, and staff personnel. Federal, state, and local factors will be analyzed.
- EDA 6232 Legal Aspects of School Operation** **3 cr (3,0)**
PR: Basic Teacher Certificate or C.I. Study of state and federal laws affecting the operation of public schools emphasizing individual rights and responsibilities of students, faculty, and administrators.
- EDA 6240 Educational Financial Affairs** **3 cr (3,0)**
PR: Basic Teacher Certificate or C.I. Theoretical and practical approaches to managing school business affairs at central office and individual school levels.
- EDA 6260 Educational Systems Planning and Management** **3 cr (3,0)**
PR: Basic Teacher Certificate or C.I. Application of current educational management and behavioral theory for systems approaches in schools and educational facilities.
- EDA 6300 Community School Administration** **3 cr (3,0)**
PR: C.I. The relationships between the school and the community with special emphasis on community needs and the development of a total community school program.
- EDA 6502 Organization and Administration of Instructional Programs** **3 cr (3,0)**
PR: Basic Teacher Certificate or C.I. Study of school organization, administration and management with emphasis toward organizational theory, leadership, evaluation and change and improvement strategies.
- EDA 6540 Organization and Administration of Higher Education** **3 cr (3,0)**
PR: C.I. Purposes, organizations and administration of two-year and four-year institutions of higher education in the U.S. Public and private colleges are studied.
- EDA 6946 Internship** **1-6 cr**
PR: C.I. Normally, the Educational Leadership Internship is completed during the latter part of the degree program. Application must be made in semester prior to internship through the student's advisor.
- EDA 7192 Educational Leadership** **4 cr (4,0)**
PR: Advanced graduate status of C.I. An analysis of the interactive process and functioning of groups; development of skills essential for effective educational leadership; and the change process.
- EDA 7195 Politics, Governance and Financing of Educational Organizations** **4 cr (4,0)**
PR: Advanced graduate status or C.I. The study of policy development as a political process; governance issues; and financial issues in education.

- EDA 7205 Planning, Research and Evaluation Systems in Educational Administration** 4 cr (4,0)
PR: Advanced graduate status or C.I. The study of research and evaluation methodologies, system theory, and planning and design strategies in educational administration.
- EDA 7225 Educational Personnel, Contracts and Negotiations** 4 cr (4,0)
PR: Advanced graduate status or C.I. Program and completion of a course in school law. Readings, discussions and research pertaining to administration of educational personnel and contracts with emphasis on collective bargaining, negotiations and grievance resolution.
- EDA 7235 Seminar in School Law** 3 cr (3,0)
PR: C.I. Seminar to explore various legal aspects related to the administration and organization of American education and to enable the individual to research in depth selected legal topics.
- EDA 7241 Economics of Public Education** 3 cr (3,0)
PR: C.I. Economic effects of schools upon the local, state and national economy; resource allocation and education investment.
- EDA 7260 Educational Facilities** 3 cr (3,0)
PR: C.I. Administration of educational facilities such as surveys, finance plans and specifications, equipment, contracts, construction procedures, maintenance and custodial services.
- EDA 7274 Seminar: Applications of Technology to Educational Leadership** 3 cr (4,0)
PR: EDA 6260 or C.I. Study of administrative and leadership technology applications at the school building or district level.
- EDA 7905 Directed Independent Study** 3 cr
- EDA 7930 Seminar in School Administration** 3 cr (3,0)
PR: C.I. Discussion of problems in school administration, patterns of curriculum organization and research projects.
- EDA 7943 Field Project** 3 cr (3,0)
PR: C.I. Field experience and projects for advanced graduate students. Participation in school plant surveys, accreditation visitation, curriculum studies, administrative analysis, field research. May be repeated for credit.
- EDA 7919 Dissertation Research** 1-6 cr
PR: C.I.
- EDA 7980 Dissertation** 1-20 cr
PR: Admission of candidacy.
- EDE 5541 Individualizing Instruction in the Elementary School** 3 cr (3,0)
PR: Basic Teacher Certificate or C.I. Study of basic philosophy, organizational patterns, techniques, materials and activities related to individualizing instruction in the elementary school classroom.
- EDE 6205 Elementary School Curriculum** 3 cr (3,0)
PR: Basic Teacher Certificate or C.I. Analysis of the forces which shape and contribute to the vertical and horizontal curriculum designs of elementary schools.
- EDF 5245 Preparation and Management of Classroom Instruction** 3 cr (3,0)
PR: C.I. Study of strategies for instructional planning and classroom management that result in optimum learning.
- EDF 5259 Classroom Management and Teaching** 3 cr (3,0)
PR: C.I. Study of teaching behaviors and strategies for classroom management that result in a minimum of behavior problems and sound instructional planning.
- EDF 6155 Lifespan Human Development and Learning** 3 cr (3,0)
Research in childhood, adolescent and adult development relevant to contemporary American education. Emphasis on application of theory to educational practice.
- EDF 6233 Analysis of Classroom Teaching** 3 cr (3,0)
PR: EDF 6481 or C.I. Analyses of effective teaching practices and their effect upon classroom instruction and learning.

- EDF 6236 Principles of Instruction and Learning** 3 cr (3,0)
The analysis and application of selected concepts and theories of learning in relation to curriculum design, classroom strategies, and instructional techniques.
- EDF 6259 Strategies of Classroom Management** 3 cr (3,0)
Study of strategies of classroom management that result in optimum learning and a minimum of behavior problems.
- EDF 6401 Statistics for Educational Data** 3 cr (3,0)
PR: EDF 6481 or C.I. Design of educational evaluation; analysis of data, descriptive and inferential statistics, interpretation of results.
- EDF 6432 Measurement and Evaluation in Education** 3 cr (3,0)
PR: Graduate standing. Concepts of measurement and evaluation, classroom test construction, creation and use of derived scores, selection and use of published measurement instruments, current issues.
- EDF 6437 Development and Validation of Educational Tests and Measures** 3 cr (3,0)
PR: EDF 6401, EDF 6432. Criterion and norm-referenced test development for educational agencies; specifications, item development and trial, scaling, passing scores, and test norms.
- EDF 6481 Fundamentals of Graduate Research in Education** 3 cr (3,0)
PR: Graduate standing. Review and critique of research literature, use of library resources for educational research, and introduction to the concepts of research design and data analysis.
- EDF 6486 Research Design in Education** 3 cr (3,0)
PR: EDF 7403 or C.I. An examination of methodological techniques for specific educational problems. Intended for students in the process of designing independent research studies.
- EDF 6517 History and Philosophy of American Education** 3 cr (3,0)
PR: C.I. A critical analysis of the conceptual and operative educational systems developed in the United States of America.
- EDF 6608 Social Factors in American Education** 3 cr (3,0)
Analysis of general and specific aspects of American education as they relate to social and behavioral sciences.
- EDF 6886 Multicultural Education** 3 cr (3,0)
A survey of multicultural education; analysis of the relationship between cultural transmission, cultural pluralism, and the learning process within American schools.
- EDF 7232 Analysis of Learning Theories in Instruction** 3 cr (3,0)
PR: Advanced graduate standing or C.I. Analysis of theories and research relevant to understanding learning in educational settings.
- EDF 7403 Quantitative Foundations of Educational Research** 3 cr (3,0)
PR: EDF 6401 or C.I. Examination of appropriate methods in applied educational contexts. Consideration of analysis strategies for educational data, emphasis on identification and interpretation of findings.
- EDF 7463 Analysis of Survey, Record and Other Qualitative Data** 3 cr (3,0)
PR: EDF 6401. Applications of summative evaluation for education: interpretation of impact data, measurement scales, survey and record data.
- EDF 7475 Qualitative Research in Education** 3 cr (3,0)
PR: EDF 7463. Introduction to the philosophical and conceptual basis of qualitative research methods, strategies for gathering, analyzing and interpreting qualitative data, emerging issues.
- EDG 5325 Techniques for the Developing Professional in Education** 3 cr (3,0)
PR: C.I. Analysis, study, development and use of techniques for enhanced instruction in the educational setting.
- EDG 5337 Teaching Individuals, Small and Large Groups** 3 cr (3,0)
Study of teaching skills for effectively instructing individuals in various educational groups, with consideration of developmental and behavioral characteristics of students.
- EDG 5745 Teaching the Non-English Student** 3 cr (3,0)
PR: FLE 3063 or bilingual and non-linguistic instruction in curriculum areas and in English as a second language.

- EDG 5941 Clinical Practice** 2-8 cr (0,11)
PR: Admission to STEP II, III or IV. Clinical internship in an appropriate educational setting under the direction of a university supervisor or peer teacher.
- EDG 6046 Contemporary Issues in Education** 3 cr (3,0)
An analysis of current trends in education and their impact on educational programs.
- EDG 6223 Curriculum Theory and Organization** 3 cr (3,0)
An exploration and examination of the foundations, design, development and organization of curriculum in K-Plus settings and professionals' roles in curriculum decision making.
- EDG 6253 Curriculum Inquiry** 3 cr
Provides participants with the knowledge and skills necessary to understand, plan, and implement effective curriculum practices and change in K-Plus and other instructional settings.
- EDG 6285 Evaluation of School Programs** 3 cr (3,0)
PR: Graduate standing. History of program evaluation, systems approaches to program evaluation, concepts of stakeholder and qualitative approaches to program evaluation, the role of evaluator and administrator.
- EDG 6327 Techniques of Game Use in Education** 3 cr (3,0)
Analysis, development, and use of educational games as an approach to classroom teaching.
- EDG 6415 P.R.I.D.E. (Professional Refinements in Developing Effectiveness)** 3 cr (3,0)
PR: C.I. Questioning techniques, student non-verbal communication; build a symmetry of classroom rewards and penalties; analyze critical incidents that institute practices for the lowest risk and greatest gain.
- EDG 6416 Project: T.E.A.C.H.** 3 cr (3,0)
PR: C.I. Topics in questioning and paraphrasing skills, positive support problem, solving skills, counseling techniques, non-confrontation strategies, group dynamics and discipline decision making.
- EDG 6417 Teaching Through Learning Channels** 3 cr (3,0)
PR: C.I. Teaching effectiveness on identifying and use of student learning channels, analysis of curricula based on learning channels; develop alternative strategies to meet needs of heterogeneous classroom.
- EDG 6940 Graduate Internship** 1-8 cr (0,1-8)
PR: Approval of Student Internship Office. Internship in an appropriate educational setting under the direction of a qualified field supervisor and/or a university supervisor. (May be repeated for credit.)
- EDG 7221 Advanced Curriculum Theory** 3 cr (3,0)
PR: EDF 6232; ESE 6325 or C.I. An analysis of the research base which supports the various dimensions of the curriculum field.
- EDG 7356 Models of Teaching and Instructional Theory** 3 cr (3,0)
PR: EDF 6232 or C.I. Examination of models of teaching. Focus on the roles of the teacher; applicable contexts and learning goals; historical, philosophical, learning, and research bases.
- EDG 7692 Issues in Curriculum** 3 cr (3,0)
PR: EDG 7221; EDG 7356 or C.I. Examination of the relationships between the research bases of instructional and curriculum theories with emphasis on current issues and concerns.
- EDG 7919 Dissertation Research** 1-6 cr
PR: C.I.
- EDG 7939 Special Topics/Seminars** 1-6 cr
PR: Doctoral level.
- EDG 7980 Dissertation** 1-20 cr
PR: Admission to Candidacy.
- EDH 6065 History and Philosophy of Higher Education** 3 cr (3,0)
PR: C.I. Early European and American universities, both state and private. Also considers small and private junior and senior colleges.
- EDH 6215 Community College Curriculum** 3 cr (3,0)
PR: C.I. Examination of the background, development, function, and goals of the curriculum of the community college.

- EDH 6505 Finance in Higher Education** 3 cr (3,0)
PR: Completion of Phase II of Education Professional Preparation or C.I. Fundamental considerations in the finance of institutions of higher education.
- EDH 6305 Improvement of Instruction in Colleges** 3 cr (3,0)
PR: C.I. Purposes, trends, outcomes and special programs in the curriculum. Considers techniques for identifying, improving and rewarding good college teaching. Test construction, measurement and learning theories.
- EDM 5235 Teaching in the Middle School** 3 cr (3,0)
Methods of middle school teaching; team planning and teaching; developmental and learning patterns of the emerging adolescent; use of alternative teaching strategies.
- EDS 5356 Supervision of Professional Laboratory Experiences** 3 cr (2,1)
PR: C.I. Study of the undergraduate professional laboratory experiences program with emphasis on the role and responsibilities of the teacher education associate or supervising teacher.
- EDS 5357 Supervision of Clinical Experiences** 3 cr (3,0)
PR: C.I. Study of the beginning teacher and STEP programs with emphasis on the role and responsibilities of the peer teacher or building level administrator.
- EDS 6050 Supervision of Instruction** 3 cr
Effective supervisory principles and practices which can be used for instructional improvement.
- EDS 6053 Trends in Educational Supervision** 3 cr (3,0)
PR: Basic supervision course or C.I. Examination and analysis of the trends, issues, and problems in educational supervision.
- EDS 6100 Leadership** 3 cr (3,0)
PR: C.I. Analysis of the interactive process within and between groups, emphasizing the formation and functioning of groups; development of skills essential for effective leadership.
- EDS 6111 Administration and Supervision of Staff Development** 3 cr (2,1)
PR: Basic Teacher Certificate or C.I. Role and procedures for the supervisor or administrator in staff development. Assessment of staff development needs and delivery systems are stressed.
- EDS 6123 Educational Supervisory Practices I** 3 cr (3,0)
PR: Basic Teacher Certificate or C.I. Analysis of effective supervisory behavior as it relates to human relations/communication skills; leadership; motivation; curriculum development; community relations; and service to teaching.
- EDS 6130 Educational Supervisory Practices II** 3 cr (3,0)
PR: Basic Teacher Certificate or C.I. Analysis of effective supervisory behavior as it relates to planning and change; observation and conferencing skills; staff and group development, problem solving; and decision making.
- EEC 5205 Programs and Trends in Early Childhood Education** 3 cr (3,0)
PR: Basic Teacher Certificate or C.I. Philosophy, content, facilities, instructional materials and activities appropriate for children 3 to 8 years of age; current research; issues and trends. Concurrent laboratory experiences.
- EEC 5206 Organization of Instruction in Early Childhood Education** 3 cr (3,0)
PR: Basic Teacher Certificate or C.I. Organization and techniques in instruction relating to language arts, social sciences, science, mathematics, health and physical education; problems relating to reading readiness perception and cognition (K-3). Concurrent laboratory experience.
- EEC 5208 Creative Activities in Early Childhood** 4 cr (4,0)
PR: Basic Teacher Certificate or C.I. Organization of instruction and methods for creative activities involving music, art, literature and educational toys. Integration of activities and basic skills curriculum (K-3). Concurrent laboratory experience.
- EED 6071 Behavior Disorders in Schools** 3 cr (3,0)
PR: Basic Teacher Certificate or C.I. Assessment/analysis of behavior disorders, cause and effects, identification and theories.
- EED 6215 Development of a Personalized Program for Children with Behavior Disorders** 3 cr (3,0)
PR: Basic Teacher Certificate or C.I. Study of various approaches to use in teaching children with

behavior disorders including precision teaching, behavior management techniques and interpersonal communications skills.

EED 6226 Theory and Application for EH

3 cr (3,0)

PR: C.I. Study of various approaches to use in teaching emotionally handicapped children interpersonal and cognitive skills with special emphasis on the severe and moderate populations.

EED 6247 Educational Programming for Children with Behavior Disorders

3 cr (3,0)

PR: Basic Teacher Certificate or C.I. A study of existing models and theories of educational programs for children with behavior disorders.

EEX 5051 Exceptional Children in the Schools

3 cr (3,0)

PR: Senior Standing or C.I. Characteristics, definitions, educational problems and appropriate educational programs for the exceptional children in schools.

EEX 6061 Instructional Strategies PREK-6

3 cr (3,0)

A varying exceptionalities strategies (SLD,EH,MH) course using a cross-categorical model. The course is concerned with the pre-k handicapped child through grade 6.

EEX 6065 Instructional Strategies 6-12

3 cr (3, 0)

A varying exceptionalities strategies (SLD,MH,ED) course using a cross-categorical model. The course is concerned with grades 6-12 and low incidence populations.

EEX 6107 Teaching Spoken and Written Language

3 cr (3,0)

Diagnosis and remediation of spoken and written language problems found in the exceptional populations. Overview of alternative methods of communication.

EEX 6257 Exceptional Adolescents

3 cr (3,0)

An examination of the problems, diagnosis, teaching strategies and materials peculiar to the exceptional adolescent.

EEX 6266 Assessment and Curriculum Prescriptions for the Exceptional Population

3 cr (3,0)

Assessment, curriculum design, interpretation and communication of test results, and analysis of available software for the exceptional populations plus an examination of learning strategies.

EEX 6342 Seminar—Critical Issues in Special Education

An examination of research and current literature dealing with some of the critical issues in all areas of special education.

EEX 6524 Organization and Collaboration in Special Ed.

3 cr (3,0)

PR: C.I. The course is designed to address evaluation, assessment, personnel resource, grant writing and other administrative issues. Collaborative models of intervention and service delivery are presented.

EEX 6612 Methods of Behavioral Management

3 cr (3,0)

Analysis of the principles of behavior management and precision teaching and application of these principles to the solving of classroom management problems.

EEX 6863 Supervised Teaching Practicum with Exceptional Children

2-7 cr (12-40)

PR: Bachelor's degree, approved program and C.I. Supervised observation and teaching of an exceptional student.

EGC 5005 Introduction to the Counseling Profession

3 cr (3,0)

PR: Completion of Phase II of Education Professional Preparation or C.I. Overview of the philosophy, organization, administration and the roles of counselors in various work settings

EGC 5036 Guiding Human Relationships

3 cr (3,0)

PR: Senior standing or Basic Teacher Certificate. Human relationship skills which will enhance intra- and inter-personal relating skills in classrooms.

EGC 6045 Counseling with Children and Adolescents

3 cr (3,0)

PR: EGC 6436 and EDF 6155 or C.I. Study of counseling theory, process and techniques as applied to children and adolescents. Course will contain an experiential component.

EGC 6XXX Human Sexuality and Relationships

3 cr (3,0)

A basic course in understanding how human beings form intra- and interpersonal relationships and how sexuality develops.

- EGC 6055 Student Personnel Services in Higher Education** **3 cr (3,0)**
 PR: Completion of Phase II of Education Professional Preparation or C.I. A basic introduction to student personnel services which covers philosophy, history, functions, theory and issues.
- EGC 6057 The College Community and the Student** **3 cr (3,0)**
 PR: Completion of Phase II of Education Professional Preparation or C.I. and EGC 5005. A study of the composition of student populations in American colleges and universities and the factors within the learning environment which support student development.
- EGC 6215 Individual Psycho-Educational Testing I** **3 cr (3,0)**
 An overview of appraisal instruments for individual testing with emphasis on administration, scoring, and interpretation. Designed for practitioners interested in understanding individual assessment.
- EGC 6225 Individual Psycho-Educational Testing II** **3 cr (3,1)**
 PR: C.I. Analysis of test theory and practice in administration, scoring, and interpretation of tests assessing achievement, visual-motor and cognitive ability, adaptive behavior and self-concept.
- EGC 6235 Procedures for Group Testing** **3 cr (2,1)**
 PR: EGC 5005 or EGC 6426, EDF 6481 or EDF 6482. Survey of various educational and psychological objective instruments used in schools to measure achievement, aptitude, interests, ability. Emphasis on administration and score interpretation.
- EGC 6317 Career Development** **3 cr (3,0)**
 PR: EGC 5005, 6426 or 6055; EDF 6481, or C.I. A study of career development theories, occupational and educational information, approaches to career decision-making, life-style and leisure in the development of the whole person.
- EGC 6409 Current Trends in Counseling** **3 cr (3,0)**
 PR: EGC 5005 or 6426 or 6055 or C.I. Current trends affecting the rapid changes in the counseling field.
- EGC 6414 Family Counseling I** **3 cr (1,2)**
 PR: EGC 5005 or EGC 6426, or C.I. Presentation of specific family counseling theories. An evolution and current state of the art.
- EGC 6415 Family Counseling II** **3 cr (1,2)**
 PR: EGC 6414, EDF 6481, or C.I. Presentation of techniques to work with entrenched, paradoxical, and "fixed" family systems which pose problems for the family and the Counselor.
- EGC 6426 Mental Health Care Systems** **3 cr (3,0)**
 PR: EGC 5005 or C.I. Foundations of mental health counseling including organizational, administration, fiscal and accountability structures.
- EGC 6435 Theories of Individual Counseling** **3 cr (3,0)**
 PR: EGC 5005 or EGC 6426, EDF 6481, or C.I. Major theories and approaches to counseling, correlating them with counterpart theories of personality and learning.
- EGC 6436 Techniques of Counseling** **3 cr (1,2)**
 PR: EGC 6435 or C.I. The nature of the counseling and its relationships to theoretical concepts.
- EGC 6438 Play Process in Counseling with Children** **3 cr (3,0)**
 PR: EGC 6045, 6505, or C.I. Theories and application of the principles of play in the counseling process with children.
- EGC 6446 Practicum in Counseling** **3 cr (1,3)**
 PR: EGC 6505 or C.I. Supervised counseling emphasizing competence in (1) individual counseling; (2) working with groups; (3) tests in educational-career-personal counseling. May be repeated for credit.
- EGC 6461 Counseling Substance Use and Abuse** **3 cr (3,0)**
 PR: EGC 5005 or EGC 6426, or C.I. Examination within systematic, theoretical framework of the function that a substance, individual and the environment play in use and abuse of illicit and licit substances.
- EGC 6463 Counseling Special Populations** **3 cr (3,0)**
 PR: EGC 5005 or EGC 6426 or C.I. Application of counseling principles with various special populations including multicultural subgroups, persons of abuse, exceptional children, gay and lesbian people, etc.
- EGC 6467 Counseling Older Persons and Their Families** **3 cr (3,0)**
 PR: EGC 5005 or EGC 6426 or C.I. A basic course presenting an overview of the nature, process, and theory of counseling older persons and their families.

EGC 6500 Guidance and Counseling of Gifted/Talented Individuals 3 cr (3,0)
 Guidance and counseling procedures and strategies for gifted/talented students; self-assessment; group dynamics; communication with parents; career goals; alternate educational opportunities.

EGC 6505 Group Procedures and Theories in Counseling 3 cr (3,0)
 PR: EGC 6436. This course is designed to give the student an understanding of the role of theories in group counseling as well as the many process applications of groups.

EGC 6515 Advanced Group Counseling 3 cr (1,2)
 PR: EGC 6505 or C.I. This course is designed to give students practical experience in leading groups. It is also intended to challenge the student to explore professional and advanced issues in group counseling.

EGC 6606 Organization and Administration of School Counseling and Guidance Programs 3 cr (3,0)
 PR: EGC 5005. In-depth analysis of counseling and guidance programs in schools, including the development and management of comprehensive programs.

*Approval for course not received by BOR before catalog sent to press.

EGC 6706 Consultation, Staffing and Case Management 3 cr (2,0)
 PR: EGC 6505 or C.I. Understanding the counselor's role as consultant and staffing team member. Study of case management procedures.

EGC 6785 Ethical and Legal Issues 3 cr (3,0)
 Studies of ethical standards and legal issues in counseling and other human service professions.

EGC 6946 Counseling Internship 1-6 cr (1,1-6)
 PR: C.I. Supervised placement in setting appropriate for program track. (May be repeated for credit.)

EGI 6051 Understanding the Gifted/Talented Student 3 cr (3,0)
 A study of characteristics of the gifted/talented students; theories and research; identification procedures; special problems; educational forces.

EGI 6245 Program Planning and Methodology for Gifted/Talented Students 4 cr (4,0)
 A study of organization, curriculum, strategies and activities for the gifted/talented student; diagnostic teaching; learning-teaching styles; instructional materials; individualized instruction.

ELD 6112 Foundation and Diagnosis of Learning Disabilities 4 cr (4,0)
 PR: Basic Teacher Certificate or C.I. A study of the history, definition, causes, characteristics and current issues; consideration of diagnostic tests, materials and procedures.

ELD 6304 Management and Teaching Strategies for the Learning Disabled Student 4 cr (4,0)
 PR: ELD 6112 or C.I. Prescriptive programming of teaching and management techniques based on a diagnosis of basic skill areas of the learning disabled child.

ELD 6323 Theory and Application for SLD 3 cr (3,0)
 PR: C.I. Systematic programming techniques for Specific Learning Disabilities based on research and diagnostic information with special emphasis on the moderate population.

ELD 6944 Diagnostic Learning-Disabilities Laboratory 1 cr (0,1)
 A laboratory designed for individual competence measurement of testing-evaluation skills. Must be scheduled concurrently with ELD 6112, Foundations and Diagnosis of LD.

EME 5051 Technologies of Instruction & Information Management 3 cr (3,0)
 Theories and practices utilizing instructional media and information technologies. Emphasis on new and emerging technologies and their effects on the school and media program.

EME 5054 Instructional Systems: A Survey of Applications 3 cr
 Applications of instructional technology in settings other than public schools. Survey of facilities, programs, and services in business, industry, religion, government, higher education and medical settings.

EME 5056 Communication for Instructional Systems—Process 3 cr (3,0)
 Principles of written and oral communications for instructional technologists; development of assertiveness and interpersonal skills; conducting training programs for employees; creating hard copy materials.

- EME 5057 Communication for Instructional Systems—Application** **3 cr (3,0)**
PR: EME 5056. Applications of technology, communications theory, platform skills, and instructional design to the effective presentation of training programs and instruction.
- EME 5208 Production Techniques for Instructional Settings** **3 cr (3,0)**
Skills in producing instructional materials. Emphasis on graphic, audio, video and photographic skills and the application of instructional and communication theories.
- EME 5225 Media for Children and Young Adults** **3 cr (3,0)**
Survey of materials for children's and young adults' informational and recreational needs; analysis, evaluation, and utilization of print and non-print materials.
- EME 5408 Computer Applications in Instructional Technology** **3 cr (3,0)**
Techniques and skills for the use of computers for productivity and instruction by the instructional technologist.
- EME 6053 Current Trends in Instructional Technology** **3 cr (3,0)**
PR: EME 6613. Survey of current trends and issues of importance to the field of instructional technology.
- EME 6062 Research in Instructional Technology** **3 cr (3,0)**
PR: EDF 6481, EME 6613 or EME 6605. Critical review and evaluation of landmark research in the areas of educational media, instructional design and instructional systems.
- EME 6105 Collection Development Policies and Procedures** **3 cr (3,0)**
Principles of collection development for the school library media center. Acquisition, weeding, inventory and maintenance procedures. Emphasis on intellectual freedom and evaluation of the collection.
- EME 6209 Advanced Production Techniques** **3 cr (3,0)**
PR: EME 5208 or EME 5057 or C.I. Advanced skills in graphic, photographic, audio, and video production. Integration of media into instructional packages. Application of instructional development skills and working with clients.
- EME 6313 Media Systems Design** **3 cr (3,0)**
PR: EME 5054, EME 6613. Principles of communication, learning theory, and research in instructional technology applied to the design of mediated instructional messages.
- EME 6403 Computer Assisted Instruction** **3 cr**
PR: EME 5408. Utilization of commercial authoring systems and authoring languages to produce CAI ranging from drill and practice through simulations. Emphasis upon design and development phases.
- EME 6455 Instructional Applications of Interactive Video** **3 cr (3,0)**
PR: EME 5408. Examines videotape and videodisc based interactive video systems as they apply to instructional settings. Requires basic knowledge of computer literacy and instructional design theory.
- EME 6605 Role of the Media Specialist in Curriculum & Instruction** **3 cr (3,0)**
PR: EME 5051, EME 5208. Development of skills in instruction and instructional design. Emphasis on teaching, consultation and media skills and curricular involvement of the media specialist.
- EME 6613 Instructional System Design** **3 cr (3,0)**
PR: EME 5054. Systematic design of instruction including task analysis, learner analysis, needs assessment, content analysis, specification of objectives, media selection, evaluation and revision; analysis of ID models.
- EME 6705 Administration of Instructional Systems** **3 cr (3,0)**
PR: EME 5408, EME 6613. Provides opportunities for students to examine parameters, problems, and areas of importance in the management of instructional systems.
- EME 6706 Administrative Principles in Media Centers** **3 cr (3,0)**
PR: EME 6605. Principles of planning, evaluating, budgeting, staffing, and marketing the school media program. Development of policies and procedures for the school media center; legislation technology, professionalism.
- EME 6805 Organization of Media and Information** **3 cr (3,0)**
Methods for organizing print and non-print media, with instruction in cataloging and classification, using standard bibliographic tools and procedures.
- EME 6807 Information Sources and Services** **3 cr (3,0)**
Development of skills in identifying appropriate information sources for school media centers, providing reference services, and teaching research skills and search strategies.

- EME 6809 Information Retrieval Systems** 3 cr (3,0)
PR: EME 5408. Examines applications of information retrieval that are appropriate for instructional technologists. Includes elements of search strategy construction, database and index structure, and online search procedures.
- EMR 6205 Theory and Application for EMH** 3 cr (3,0)
PR: C.I. Study of various approaches to use in teaching the Educable Mentally Handicapped motor, interpersonal and cognitive skills with special emphasis on the severe and moderate applications.
- EMR 6261 Career Planning for the Mentally Handicapped** 2 cr (2,0)
PR: Basic Teacher Certificate. Instruction and practice in career planning with specific activities in homemaking skills, industrial arts, and job exploration.
- EMR 6362 Classroom Organization and Curriculum for Teaching the Mentally Handicapped** 4 cr (4,0)
PR: Basic Teacher Certificate or C.I. Organization, scheduling, materials, equipment, instructional procedures, appropriate curriculum experiences and adjustments, media use, and development pre-vocational skills for EMH, TMH, and PMH.
- EPH 5335 Physical and Sociological Implications of Handicapping Conditions.** 3 cr (3,0)
Overview of physical and sociological factors which may contribute to delayed learning or physical impairments in the exceptional populations. Physical interventions and first-aid practices are examined.
- ESE 5214 Secondary School Curriculum Improvement** 3 cr (3,0)
PR: Basic Teacher Certificate or C.I. Secondary school self-studies for curriculum projects, accreditation reports or staff development.
- ESE 6235 Curriculum Design** 3 cr (3,0)
PR: Basic Teacher Certificate or C.I. Goal analysis, task analysis, needs assessment and writing performance objectives for developing courses of study.
- ESE 6325 Curriculum Theory** 3 cr (3,0)
PR: Graduate standing or C.I. The foundations, design, constituent parts, development and implementation of change in public school curricula.
- ESE 6416 Curriculum Evaluation** 3 cr (3,0)
PR: ESE 6235, or an equivalent curriculum course.
- EVT 5260 Cooperative Programs in Vocational Education** 2-4 cr (2-4,0)
PR: Basic Teacher Certificate or C.I. Study of cooperative vocational programs and achievement of competencies needed to establish, manage and coordinate co-op program activities in all vocational areas.
- EVT 5315 Applied Clinical Teaching Techniques in Vocational Education** 2-3 cr (2-3,0)
PR: Basic Teacher Certificate or C.I. Study and practice of clinical teaching methods, development of student performance assessment instruments, planning clinical learning experiences, and record-keeping.
- EVT 5316 Clinical Coordination for the Health Occupations Teacher** 2-3 cr (2-3,0)
PR: Basic Teacher Certificate or C.I. Development of clinical guidelines, resources, student schedules, and risk-management programs. Includes negotiating clinical contractual agreements and planning field supervision.
- EVT 5561 Student Guidance in the Vocational Program** 2-3 cr (2-3,0)
PR: Basic Teacher Certificate or C.I. Achievement of skills used by teachers as they gather student data, confer with students and help students plan for employment or further education.
- EVT 5564 Student Vocational Organizations** 2-3 cr (2-3,0)
PR: Basic Teacher Certificate or C.I. Competencies needed by vocational teachers as they establish and supervise student vocational organizations in secondary and post-secondary schools.
- EVT 5817 Management of Vocational Programs** 2-4 cr (2-4,0)
PR: Basic Teacher Certificate or C.I. Study and achievement of selected competencies needed by vocational teachers, supervisors and local administrators in the management of vocational education programs in the schools.
- EVT 6264 Administration in Vocational Education** 3 cr (3,0)
PR: Basic Teacher Certificate or C.I. Administrative responsibilities in a local program of Vocational Education which includes two or more fields of occupational education.

- EVT 6265 Supervision in Vocational Education** **3 cr (3,0)**
PR: Basic Teacher Certificate or C.I. Supervisory techniques for planning and implementing improvement of staff, curriculum and personal relations in Vocational Education.
- EVT 6267 Vocational Program Planning, Development and Evaluation** **2-4 cr (2-4,0)**
PR: Basic Teacher Certificate or C.I. Achievement of selected teacher competencies related to program objectives, courses of study, long range plans and techniques for evaluating vocational program effectiveness.
- EVT 6664 School/Community Relations for Vocational Education** **2-4 cr (2-4,0)**
PR: Basic Teacher Certificate or C.I. Achievement of proficiency in the use of media techniques to promote the vocational program. Development and maintenance of productive relationships between school and community groups.
- EXP 5445 Psychology of Learning and Motivation** **3 cr (3,0)**
PR: DEP 5057 or C.I. Examination of theories and research concerning the acquisition and retention of behavior as well as motivational factors which influence learning and behavior.
- HSC 6132 Health Care Finance** **3 cr (3,0)**
PR: ACC 5004, FIN 5405, Graduate status. The identification of resources available to health care institutions, allocation of resources and control of resource expenditures.
- HSC 6153 Case Studies in Health Law** **3 cr (3,0)**
PR: Graduate status or C.I. Health law including patient care, liability, malpractice, workmen's compensation, and legal responsibilities of health personnel.
- HSC 6392 Issues and Trends in the Health Professions** **3 cr (3,0)**
PR: Graduate status or C.I. Exploration of current status, issues, problems and future trends in the practice and education of health professions.
- HSC 6402 Environmental Health** **3 cr (3,0)**
PR: Graduate status or C.I. Recognition and evaluation of control problems arising from environmental contamination, which includes safe water supply, waste disposal, and food resources.
- HSC 6412 Epidemiology** **3 cr (3,0)**
PR: Graduate status or C.I. A study of the distribution and determinants of diseases and injuries in human populations.
- HSC 6513 Principles and Practice of Medicine** **3 cr (3,0)**
PR: Graduate status or C.I. A comprehensive survey of medicine.
- HSC 6605 Health and Society** **3 cr (3,0)**
PR: Graduate status or C.I. Understanding health and illness as defined by patients, providers, and other persons in the social system.
- HSC 6911 Scientific Inquiry in the Health Profession** **3 cr (3,0)**
PR: Graduate status or C.I. Research design and evaluation in health professions.
- INP 6317 Organizational Psychology and Motivation—See College of Arts and Sciences, Department of Psychology**
- LAE 5465 Literature for Adolescents** **3 cr (3,0)**
PR: Senior standing or C.I. Selecting and evaluating books for adolescents with emphasis on the use of literature in the development of young people.
- LAE 6467 Studies in Adolescent Literature** **3 cr (3,0)**
Analysis of major works in genre, examination of criticism, instructional strategies, and research in teaching adolescent literature.
- LAE 6637 Research in Teaching** **3 cr (3,0)**
Examination and interpretation of major research in English Education. Design of models for research in language instruction in secondary schools.
- LAE 6616 Trends in Language Arts Education** **3 cr (3,0)**
PR: Basic Teacher Certificate or C.I. Historical development and trends; English usage systems; materials; instructional strategies.

- LAE 6714 Investigation in Children's Literature** **3 cr (3,0)**
PR: Basic Teacher Certificate or C.I. Learning through the utilization of children's literature; literature analysis and evaluation; story telling skill development; visual and reference materials.
- LEI 6443 Recreation** **3 cr (2,1)**
A comprehensive study of public, private and school recreation programs.
- MAE 5318 Current Methods in Elementary School Mathematics** **3 cr (3,0)**
Strategies of instruction of computation and concepts of number, geometry and measurement. Instructional materials. (Meets Elementary Education certification requirements.)
- MAE 5325 Teaching Mathematics in the Middle/Junior High School** **3 cr (3,0)**
PR: 12 semester hours of mathematics including at least College Algebra. Consideration of the curriculum and instructional techniques appropriate for students in Middle/Junior High School.
- MAE 5356 Teaching General Mathematics in the Secondary School** **3 cr (3,0)**
PR: MAE 3330 or C.I. This course addresses specific techniques for developing general mathematics skills and concepts beginning in Grade 6. Problem solving, motivation and innovative methods are explored.
- MAE 5395 Teaching Measurement in Schools** **3 cr (3,0)**
Metric system, methods of developing different measurement skills and concepts and curriculum changes needed to accommodate measurement.
- MAE 5637 Laboratory Programs in Mathematics** **3 cr (2,1)**
PR: Basic Teacher Certificate or C.I. Design and development of special materials and projects for mathematics independent study. Emphasis teaching and applying the metric system.
- MAE 6145 Mathematics Curriculum, K-12** **3 cr (3,0)**
PR: At least 6 semester hours of graduate credit in mathematics education or C.I. Development of historical and current issues and forces in mathematics curriculum. New mathematics programs and contemporary curricular issues will be emphasized.
- MAE 6336 Teaching Advanced Mathematics in the Secondary School** **3 cr (3,0)**
PR: MAE 3330 or C.I. This course addresses topics in a pre-calculus, analysis or calculus course.
- MAE 6337 Teaching Algebra in the Secondary School** **3 cr (3,0)**
PR: MAE 3330 or C.I. This course addresses specific techniques for developing algebra skills for pre-algebra through pre-calculus algebra needs. Logical deductions, problem solving, computer applications and innovative methods are explored.
- MAE 6338 Teaching Geometry in the Secondary School** **3 cr (3,0)**
PR: MAE 3330 or C.I. This course addresses specific techniques for developing geometry skills beginning in the general mathematics classes of Grade 6 through the high school geometry course.
- MAE 6517 Diagnosis/Remediation of Difficulties in Mathematics for the Classroom Teacher** **3 cr (3,0)**
PR: Basic Teacher Certificate or C.I. The study of techniques for diagnosis and remediation of difficulties in mathematics.
- MAE 6641 Problem Solving and Critical Thinking Skills** **3 cr (2,1)**
PR: Regular Certificate or C.I. Development of procedures and practices necessary to implement critical thinking skills and problem solving techniques in the schools.
- MAE 6656 Using Technology in the Instruction of K-12 Mathematics** **3 cr (3,0)**
PR: CAP 6613 or C.I. The application of computer technology to mathematics instruction including calculators, CAI, CMI, application software, simulators, and video disc technology.
- MAE 6899 Seminar in Teaching Mathematics** **3 cr (3,0)**
PR: Six semester hours of graduate credit in mathematics education. Development of historical and current issues, forces, and individuals and their impact on the teaching of mathematics K-12. Consideration of advanced instructional techniques. (May be repeated for credit.)
- MAE 7795 Seminar on Research in Mathematics Education** **3 cr (3,2)**
PR: Doctoral standing.
- MUE 5611 Trends in Elementary School Music Education** **3 cr (3,0)**
PR: MUE 3401 or equivalent or C.I. Advanced study of instructional strategies and materials; integration of music education experiences with classroom activities; personal musical skill development; current research and new curricula.

- MUE 6155 Teaching Performing Organizations** 3 cr (3,0)
PR: Basic Teacher Certificate or C.I. Techniques and skills for the planning, administering and directing performing music organizations. Examination of historical and philosophical foundations of music education.
- MUE 6349 Advanced General Music** 3 cr (3,0)
PR: Basic Teacher Certificate or C.I. Analysis of current materials, new programs and teaching techniques in general music, K-12. Emphasis on practical applications. Examinations of psychological foundations of music education.
- MUE 6946 Practicum in Music Education** 3 cr (0,14)
PR: Basic Teacher Certificate. MUE 6349 and MUE 6155, MUE 6610 and MUE 6630 or C.I. Field experience in teaching music. (May be repeated for credit.)
- MUT, MVB, MVK, MVR, MVS, MVV, MVW - See College of Arts & Sciences, Department of Music**
- PET 6040C Analysis of Human Performance** 3 cr (2,1)
Analytical techniques of kinesiology and their methods of application to individual and team activities.
- PET 6085 Exercise Lifestyles - Adherence and Compliance** 3 cr (3,0)
An analysis of alternative lifestyles associated with the corporate wellness movement.
- PET 6086 Exercise Intervention and Risk Hazards** 3 cr (3,0)
Prevention of select major risk hazards through exercise intervention.
- PET 6146 Current Trends and Philosophical Foundations of Physical Education** 3 cr (3,0)
A comprehensive analysis of current trends, forces and events leading to the development of contemporary concepts in physical education.
- PET 6238C Perceptual Motor Development** 3 cr (2,1)
Theoretical and laboratory study of the relationship between perceptual motor development and learning. Special attention is given to identifying and remediating motor deficit.
- PET 6367 Physical Performance and Energy Supplies** 3 cr (3,0)
The relation of nutrients to aerobic performance.
- PET 6377 Physiology of Neuromuscular Mechanisms** 3 cr (3,0)
Human body morphology and function critical in producing motion, strength, power, and endurance.
- PET 6386C Environmental Exercise Physiology** 3 cr (3,2)
A study of physiological adaptation resulting from prescribed physical activity programs.
- PET 6388 Exercise Physiology and Cardiovascular Disease Prevention** 3 cr (3,0)
The physiology of exercise as it affects the onset of cardiovascular diseases.
- PET 6416 Administration of Corporate Wellness Programs** 3 cr (3,0)
Administrative implications for the development of a corporate wellness program.
- PET 6425 Curriculum Design in Physical Education** 3 cr (3,0)
Study of physical education and its existing organization. Emphasis on ethics, values, principles and issues.
- PET 6515C Measurement in Kinesiology and Physical Education** 3 cr (3,0)
Techniques of measurement and evaluation of human performance and their applications to physical education.
- PET 6615 Psychomotor Assessment of Exceptional Children** 2 cr (2,1)
PR: PET 6655 or C.I. Assessment techniques and methodology for determining psychomotor needs of exceptional children is presented. Application of competencies is required.
- PET 6645 Advanced Studies in Adapted Physical Education** 3 cr (3,1)
PR: EEX 5050. Survey course that addresses the development, educational, and socialization needs of exceptional children. A minimum of 15 observation hours are required.
- PET 6646 Methods and Curriculum in Adapted Physical Education** 4 cr (3,1)
PR: PET 6645, PET 6655, PET 6615. Individualized educational and developmental programming for exceptional children. Models of service delivery and instruction are presented. Practicum required.

- PET 6647 Program Development in Adapted Physical Education** 3 cr (3,1)
PR: C.I. Development of appropriate physical education programs for exceptional children. Course includes teacher-consultant, collaboration, inservice training, legislative issues, resource utilization.
- PET 6655 Developmental Aspects of Motor Disabilities** 3 cr (3,1)
PR: C.I. Course addresses developmental aspects of motor and health disabilities. A developmental focus is presented. Observation required.
- PET 6910 Problem Analysis - Review of Literature** 3 cr (3,0)
PR: EDF 6432 and C.I. Comprehensive review of literature related to a selected topic in physical education; identification, analysis and evaluation of developments, issues and research problems. (May be repeated for credit.)
- RED 5147 Developmental Reading** 3 cr (3,0)
Principles, procedures, organization and current practices in the elementary reading program. Materials and methods of instruction.
- RED 5514 Classroom Diagnosis and Development of Reading Proficiencies** 3 cr (3,1)
PR: RED 5147 or equivalent. Classroom diagnosis and corrective teaching in reading; instructional materials. Case study required.
- RED 6116 Trends in Reading Education** 3 cr (3,0)
PR: Basic Teacher Certificate or C.I. Analysis of historical development and current trends; management systems; instructional strategies and investigation of research.
- RED 6336 Reading in the Content Areas** 3 cr (3,0)
PR: Basic Teacher Certificate or C.I. Identification and evaluation of reading skills, diagnosis of reading problems and development of methods and materials to increase student reading performance.
- RED 6337 Reading in the Secondary School** 3 cr (3,0)
PR: RED 6336, Basic Teacher Certification or C.I. Nature of the adolescent reader; organizational patterns, principles, and procedures; diagnostic and remediation materials.
- RED 6746 Management of Reading Programs** 3 cr (3,0)
Overview of K-12 reading instruction goals and program management models; role of reading supervisor and in-service needs assessment and delivery.
- RED 6845 Clinical Diagnosis and Remediation of Reading Difficulties** 3 cr (3,0)
PR: RED 5514 or C.I. Administration and interpretation of individual tests; factors contributing to reading difficulties; case studies; instructional techniques for the severely disabled reader.
- RED 6846 Clinical Reading Practicum** 3-6 cr (0,3-6)
PR: RED 6845 or C.I. Clinical evaluation and remediation of severely disabled readers in a laboratory setting. Parent interview; case reports.
- SCE 5825 Space Science for Educators** 3 cr (3,0)
PR: Senior Standing or C.I. Introduction to space science, manned space flight and space education curriculum.
- SCE 6238 Inquiry in the Sciences** 3 cr (3,1)
PR: Graduate standing or science certification. Teaching science by inquiry in the secondary school and development of inquiry lessons.
- SCE 6237 Science Programs in Secondary School** 3 cr (3,0)
PR: Basic Teacher Certificate or C.I. Study of historical development and current trends; analysis of science curricula, materials.
- SCE 6616 Trends in Elementary School Science Education** 3 cr (3,0)
PR: Basic Teacher Certification or C.I. Study of historical development and current trends; analysis of science curricula, materials.

SPS 6601 Introduction to Psychological Services in Schools **3 cr (3,1)**

PR: Graduate admission and C.I. A course presenting an overview of the philosophy, organization, programs and operation of school psychological services.

SPS 6606 School Consultation Techniques **3 cr (3,0)**

PR: C.I. Theories and models of school consultation and clinical practice in the consultative role. (Three hours required.)

SPS 6608 Seminar in School Psychology **3 cr (3,0)**

PR: C.I. Diagnostic, instructional and prescriptive intervention techniques.

SPS 6125 Infant Development Assessment **2 cr (2,1)**

PR: Graduate admission and C.I. Analysis of test theory and practice in administration, scoring, and interpretation of instruments assessing cognitive, visual-motor ability and adaptive behavior to pre- and primary school children.

SPS 6175 Multicultural Issues and Assessment **2 cr (2,1)**

PR: Graduate admission and C.I. An investigation of some of the major multicultural issues with emphasis on administration, scoring and interpretation of instruments related to this population.

SPS 6191 Psycho-Educational Diagnosis I **3 cr (3,1)**

PR: Graduate admission and C.I. Measurement of intellectual and cognitive functioning of children and adults. Administration, scoring and interpretation of Wechsler scales and selected psychometric instruments.

SPS 6192 Psycho-Educational Diagnosis II **3 cr (3,1)**

PR: Graduate admission and C.I. Measurement of intellectual and cognitive functioning of children and adults. Administration, scoring, and interpretation of Binet IV, K-ABC, Woodcock-Johnson and other psychometric instruments.

SPS 6946 Practicum in School Psychology **1 cr (0,1)**

SPS 6949 School Psychology Internship **2-6 cr (0,2-6)**

PR: Graduate admission and C.I. Supervised placement in school setting.

SSE 6617 Trends in Elementary School Social Studies Education **3 cr (3,0)**

PR: Basic Teacher Certificate or C.I. Historical development and current trends, strategies for inquiry instruction, intellectual, social and personal dimensions of social studies.

SSE 6636 Contemporary Social Science Education **3 cr (3,0)**

PR: Basic Teacher Certificate or C.I. A survey of recent developments and contemporary programs in all areas of the social sciences.

ARE, EDA, EDE, EEX, EGC, EME, ESE, EVT, MAE, MUE, PET, RED or SPS prefixes are used for the following:

6971 Treatise

EDG, EGC, EME, MAE, MUE, PET, or RED prefixes are used for the following:

6946 Practicums, Clinical Practice

EDA or EDG prefixes are used for the following:

7980 Doctoral Dissertation

COLLEGE OF ENGINEERING

The College of Engineering offers the Master of Science, the Master of Science in Engineering, the Master of Civil Engineering, and the Doctor of Philosophy degrees.

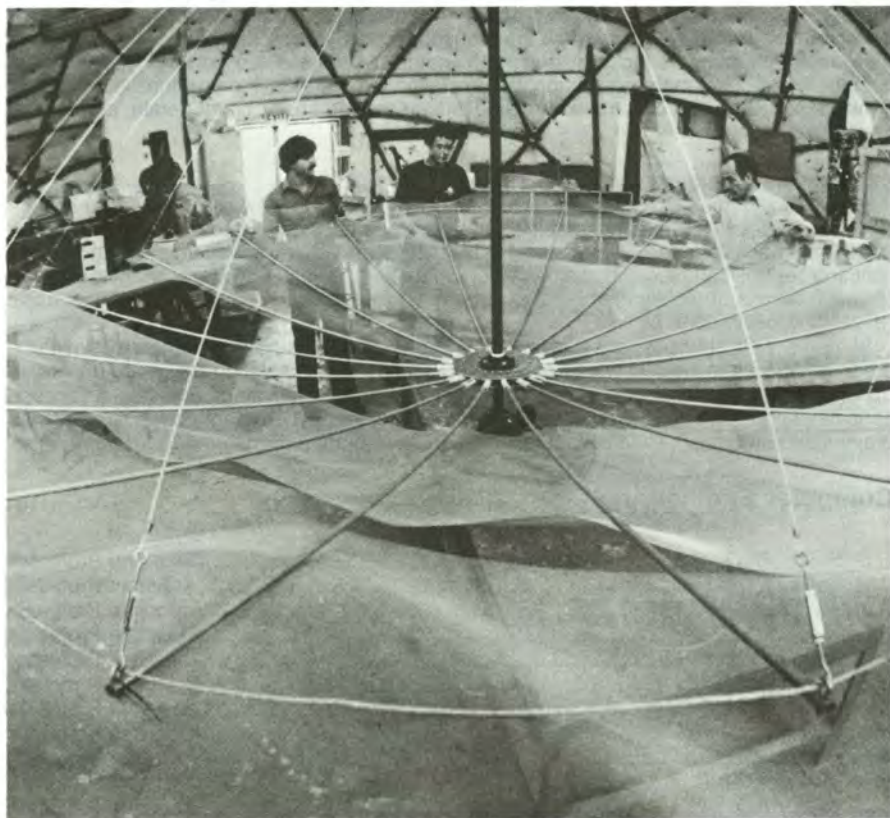
The master's programs are designed to provide for advanced professional engineering education (M.S.E.) or specialized education in selected areas (M.S., M.C.E.). It is the objective of the College of Engineering to produce well-qualified, competent graduates from outstanding accredited programs for the professional practice of engineering and to conduct research and service responsive to the needs of the State of Florida and the nation.

The Ph.D. programs provide the opportunity for advanced graduate preparation in the areas of civil engineering, computer engineering, electrical engineering, environmental engineering, industrial engineering, and mechanical engineering. These programs provide direct support for the emergence of the Central Florida area as one of the national centers of high technology industry. The program is especially accessible to the place-bound engineer who would otherwise have difficulties in fulfilling his professional career objectives.

COLLEGE ADMINISTRATION

Gary E. Whitehouse Dean
Stephen L. Rice Associate Dean
Richard N. Miller Associate Dean

Fred S. Gunnerson Director of Graduate Affairs
James K. Beck Director of Undergraduate Affairs
Office: CEBA I 281, Phone (407) 823-2455



COLLEGE OF ENGINEERING DEPARTMENTS

Civil and Environmental Engineering

<i>D.L. Block, Ph.D.; P.E.</i>	FSEC Director and Professor
<i>W.F. Carroll, Ph.D.; P.E.</i>	Professor
<i>C.D. Cooper, Ph.D.; P.E.</i>	Professor
<i>J.P. Hartman, Ph.D.; P.E.</i>	Professor
<i>D.R. Jenkins, Ph.D.; P.E.</i>	Professor
<i>R.D. Kersten, Ph.D.; P.E.</i>	Professor
<i>A.E. Radwan Ph.D.; P.E.</i>	Chair and Professor
<i>J.S. Taylor, Ph.D.; P.E.</i>	Professor
<i>M.P. Wanielista, Ph.D.; P.E.</i>	Professor
<i>Y.A. Yousef, Ph.D.; P.E.</i>	Professor
<i>J.D. Dietz, Ph.D.; P.E.</i>	Associate Professor
<i>C.M. Head, Ph.D.; P.E.</i>	Associate Professor
<i>S.S. Kuo, Ph.D.; P.E.</i>	Associate Professor
<i>D.S. Leftwich, Ph.D.; P.E.</i>	Associate Professor
<i>D.R. Reinhart, Ph.D.; P.E.</i>	Assistant Professor
<i>R.L. Wayson, Ph.D.; P.E.</i>	Assistant Professor

Civil Engineering

Graduate work and research in Civil Engineering reflect the very broad nature of the field, which has as its purpose the enhancement of the infrastructure of society. The educational program includes course work in structural analysis and design, geotechnical engineering and foundations, transportation planning and networks, construction engineering, and water resources. Faculty research interests include geotechnical studies of subsurface conditions done in part in connection with the Florida Sinkhole Research Institute. Other geotechnical interests relate to soil testing and design of advanced testing devices. Research in transportation is carried out through the Transportation Systems Institute. In the structures area, research interests include structural dynamics, structural testing, and mechanics of composite structural materials. Students completing the program find positions in consulting firms, construction and construction-related industries, and in city, county, state, and federal government agencies.

Environmental Engineering

Strong faculty research interests have resulted in a program of distinction for the college and the university. Research monies support students in the general areas of water treatment, wastewater treatment, solid and hazardous waste management, atmospheric pollution control, community noise prediction/abatement, and stormwater management. The research results of faculty members have been applied to social problems; however, basic research is being done as well.

Students with strong science or engineering backgrounds have a variety of research areas and levels of interest which they can pursue. Those completing the program find job opportunities in federal, state and local governments, consulting, industry, and post-educational areas. The Environmental Engineering education program concerns itself with prevention and correction of pollution effects on the natural and man-made environments.

Computer Engineering

<i>C.S. Bauer, Ph.D.; P.E.</i>	Chair and Professor
<i>J.M. DeCatrel, Ph.D.</i>	Assistant Professor
<i>A.J. Gonzalez, Ph.D., P.E.</i>	Associate Professor
<i>H.I. Klee, Ph.D.; P.E.</i>	Associate Professor
<i>D.G. Linton, Ph.D.; P.E.</i>	Associate Professor
<i>B.E. Petrasko, D.Eng.</i>	Associate Professor
<i>S. Khajenoori, Ph.D.</i>	Assistant Professor
<i>H.R. Myler, Ph.D.; P.E.</i>	Associate Professor
<i>A.R. Weeks, Ph.D.</i>	Assistant Professor
<i>H. L. Williams, Ph.D.</i>	Assistant Professor
<i>D.S. Wills, Ph.D.</i>	Assistant Professor

In contemporary professional engineering practice, and in research and development activities, there is an increasing need for engineers with a high degree of training and capability in the application of mathematics and computers in the modeling, simulation and solution of complex technical problems.

The current research interests of the program include embedded computer systems, computer graphics, training simulators, software engineering, computer applications, simulation, image processing, and artificial and machine intelligence.

Electrical Engineering

<i>M. Bass, Ph.D.</i>	Vice President for Research & Professor
<i>R.C. Harden, Ph.D.; P.E.</i>	Professor
<i>D.C. Malocha, Ph.D.; P.E.</i>	Professor
<i>B.E. Mathews, Ph.D.; P.E.</i>	Professor
<i>W. Mikhael, Ph.D.</i>	Professor
<i>R.L. Phillips, Ph.D.</i>	Professor
<i>M.J. Soileau, Ph.D.</i>	CREOL Director and Professor
<i>C.M. Stickley, Ph.D.</i>	Professor
<i>N.S. Tzannes, Ph.D.</i>	Chair and Professor
<i>R.L. Walker, Ph.D.; P.E.</i>	Professor
<i>M. Belkerdid, Ph.D.; P.E.</i>	Associate Professor
<i>G. D. Boreman, Ph.D.; P.E.</i>	Associate Professor
<i>C.G. Christodoulou, Ph.D.</i>	Associate Professor
<i>K. Guenther, Ph.D.</i>	Associate Professor
<i>J.E. Harvey, Ph.D.</i>	Associate Professor
<i>R. Johnson, Ph.D.</i>	Associate Professor
<i>J.J. Liou, Ph.D.</i>	Associate Professor
<i>R.N. Miller, Ph.D.; P.E.</i>	Assistant Dean and Associate Professor
<i>M.G. Moharam, Ph.D.</i>	Associate Professor
<i>P.F. Wahid, Ph.D.</i>	Associate Professor
<i>Y.A. Alsaka, Ph.D.</i>	Assistant Professor
<i>H.K. Brown, Ph.D.</i>	Assistant Professor
<i>J. Dixon, Ph.D.</i>	Assistant Professor
<i>M.G. Harris, D.Sc.; P.E.</i>	Assistant Professor
<i>T. Kasparis, Ph.D.</i>	Assistant Professor
<i>A. Mortazoui, Ph.D.</i>	Assistant Professor
<i>Z. Qu, Ph.D.</i>	Assistant Professor
<i>S. Richie, Ph.D.</i>	Assistant Professor
<i>K.B. Sundaram, Ph.D.</i>	Assistant Professor
<i>M. Sznaier, Ph.D.</i>	Assistant Professor
<i>J.S. Yuan, Ph.D.</i>	Assistant Professor

Joint Appointees:

<i>L.C. Andrews, Ph.D.</i>	Professor of Mathematics
<i>J.K. Kim, Ph.D.</i>	Professor of Physics
<i>A. Miller, Ph.D.</i>	Professor of Physics
<i>M. Richardson, Ph.D.</i>	Professor of Physics
<i>W.T. Silfuast, Ph.D.</i>	Professor of Physics
<i>G. Stegeman, Ph.D.</i>	Cobb-Hooker Professor of Physics
<i>E.W. Van Stryland, Ph.D.</i>	Professor of Physics

The M.S.E.E. degree is available to students with an undergraduate degree in electrical engineering and offers the following areas of specialization: controls, communications, erase, digital signal processing, electromagnetics, electronics, electro-optics, and microelectronics/solid state devices.

The M.S. degree in Electrical Systems and Sciences is available to students with an undergraduate degree in an area related to electrical engineering. A number of articulation courses are required for applicants of the M.S. program.

A coursework only option is also available leading to the M.S.E.E. and M.S. degrees

under Electrical Engineering. This consists of 36 hours of course work and is intended primarily for part-time graduate students.

The Ph.D. in electrical engineering is intended for exceptional students who have a master's degree and desire to work in an area of specialization.

Research interests of the faculty include antennas, microwave and millimeter wave circuits and devices, communication systems, digital signal/image processing, radar systems, IFF devices, electromagnetic theory, speech processing, VLSI design, spread spectrum systems, SAW and ACT devices, spectral estimation, solid state device modeling and CAD techniques, communication networks, integrated services digital networks, neural networks, systems and controls, robotics, robust control, computer control, microelectronics semiconductors, thin films, power system stability, bipolar device modeling, solid state lasers, optical propagation, fiber optics, optical signal processing, laser induced damage, optical testing, diffractive optics, phase conjugation, infrared detectors, fourier optics, lens design, non-linear optics.

Industrial Engineering and Management Systems

<i>J.E. Biegel, Ph.D.; P.E.</i>	Professor
<i>Y.A. Hosni, Ph.D.; P.E.</i>	Professor
<i>G.E. Schrader, Ph.D.; P.E.</i>	Professor
<i>W.W. Swart, Ph.D.; P.E.</i>	Chair and Professor
<i>G.E. Whitehouse, Ph.D.; P.E.</i>	Dean and Professor
<i>A.K. Elshennawy, Ph.D.; C.Q.E.</i>	Associate Professor
<i>C.H. Lee, Ph.D.</i>	Associate Professor
<i>J.A. Sepulveda, Ph.D.; P.E.</i>	Associate Professor
<i>M. Danz, Ph.D.</i>	Assistant Professor
<i>L.C. Morse, Ph.D.</i>	Assistant Professor
<i>M. Mullens, Ph.D.</i>	Assistant Professor
<i>E.L. Parkinson, Ph.D.</i>	Assistant Professor
<i>R.V. Rogers, Ph.D.</i>	Assistant Professor
<i>R.A. Kaufman, Ph.D.</i>	Faculty Associate

The department's graduate programs have developed to support the emergence of the Central Florida area as one of the national centers of high technology as well as service industry. The original Master of Science in Engineering (M.S.E.) offerings included Industrial Engineering and Manufacturing Engineering. The original Master of Science (M.S.) offering included Computer Integrated Manufacturing, Engineering Management, and Operation's Research. In 1984, the department began offering the nationally unique degree in Simulation Systems. This degree was specifically developed to support the Center of Excellence in Simulation and Training established in the Central Florida region. In 1989, the department received Board of Regents permission to offer Florida's first graduate degree in Product Assurance Engineering. This degree will serve the increasing demand for individuals trained in the areas of productivity and quality. The department leads the College of Engineering in doctoral degrees awarded with 6, including the college's first doctoral degree to a woman. Supporting this activity is a departmental sponsored research base of well over \$1 million, which is the highest of any industrial engineering department in Florida and fourth highest in the country on a per faculty member basis in 1989.

The department's emergence as one of the America's leading research units began in 1987 with a multi-year grant from the Florida High Technology and Industry Council to a consortium formed between General Electric Company, Embry-Riddle Aeronautical University, and UCF's Industrial Engineering Department. This grant was to support the development of an Intelligent Simulation and Training System (ISTS) to train air traffic controllers. These efforts are producing new knowledge about generic Intelligent Simulation and Training Systems. The project has supported research by 9 faculty members, 11 Ph.D. students, and 11 M.S. students. As a result of this work, multiple proposals have been prepared and submitted, including a \$15 million proposal to the National Science Foundation for the establishment of an Engineering Research Center for Human Competence Development. In 1988, the department became one of the subcontractors to a multi-year research effort involving the University of Oregon and the Florida Solar Energy Center, sponsored by the U.S. Department of Energy. The purpose of this effort is to define how to achieve Energy Efficient, Affordable Industrialized Housing in the 21st Century. In 1989, the

department became part of a multi-year effort with NASA to improve the efficiency and productivity of space shuttle processing operations.

Mechanical and Aerospace Engineering

B.E. Eno, Ph.D.; P.E.	Professor
E.R. Hosler, Ph.D.; P.E.	Professor
F.A. Moslehy, Ph.D.; P.E.	Professor
D.W. Nicholson, Ph.D.	Chair and Professor
S.L. Rice, Ph.D.; P.E.	Associate Dean and Professor
W.F. Smith, Sc.D.; P.E.	Professor
L.A. Anderson, Ph.D.; P.E.	Associate Professor
J.K. Beck, P.E.	Associate Professor
P.J. Bishop, Ph.D.; P.E.	Associate Professor
V.H. Desai, Ph.D.; P.E.	Associate Professor
F.S. Gunnerson, Ph.D.; P.E.	Associate Professor
A.H. Hagedoorn, Ph.D.; P.E.	Associate Professor
C.E. Nuckolls, Ph.D.; P.E.	Associate Professor
G.G. Ventre, Ph.D.; P.E.	Associate Professor
L. Chew, Ph.D.	Assistant Professor
A.L. Grogan, Ph.D.	Assistant Professor
A. Minardi	Assistant Professor
J. Nayfeh, Ph.D.	Assistant Professor





Major fields of emphasis in the Department of Mechanical and Aerospace Engineering include energy conservation and alternative energy sources (photovoltaic, solar, thermoelectric, thermionic, wind), non-linear mechanics (dynamic stability), propulsion, combustion, experimental mechanics (holographic interferometry, laser speckle metrology, photoelasticity, strain measurements, acoustic emission, and modal analysis), tribology, materials science, corrosion, electrochemical engineering, velocimetry mechanics of materials, finite element and boundary element methods, heat transfer, multi-phase flow, heat pipes, computational fluid mechanics, hypersonics, vibrations, nuclear power, computer-aided-engineering, expert systems in mechanical engineering design, surface science, materials processing, and laser-surface interactions.

Current research projects include heat transfer in materials processing; stress corrosion cracking; degradation of biomechanical implant materials; thermal resistance of building envelopes; dynamic stability of non-linear systems; boiling heat transfer; heat pipe design; finite element analysis in creep, fatigue and fracture; dynamic analysis of flexible mechanisms; image recognition in problems of large deformation; modal analysis; random signal analysis; surface roughness measurement by laser speckle image processing; optical metrology, laser speckle photography and boundary element techniques in experimental mechanics; acoustic emission analysis; displacement field measurement in tribosystems; vehicle design; biomechanical impact behavior prediction; chemomechanical phenomena in machining processes; wear of materials; and characterization of microelectronic materials, and phase change material thermal energy storage.

The Department of Mechanical and Aerospace Engineering collaborates in teaching and research with other engineering departments within the College of Engineering, with the Florida Solar Energy Center, with the Center for Research in Electro-Optics and Lasers, the Institute for Simulation and Training, and with various other institutes and industries in the Central Florida Research Park, at Cape Canaveral and at NASA's Kennedy Space Center.

MASTER'S DEGREES

Admission

University Admission Requirements

The Graduate Record Examination (GRE) is required of all graduate students. An applicant must meet the minimum graduate admission criteria of a GPA of 3.0 (4.0 = A) on the last two years of undergraduate degree work or score above 1000 on the quantitative-verbal sections of the GRE.

College Admission Requirements

In addition to the above minimum criteria University admission requirements, College admissions require the following:

- a. A minimum GPA of 2.8 or better on the last two years of undergraduate degree work independent of the GRE score.
- b. Applicants for the M.S.E. program must have the undergraduate engineering degree or equivalent from an ABET accredited curriculum in an appropriate discipline area.
- c. Applicants for the M.S. program must present baccalaureate credentials appropriate to the specialized area of study.
- d. All applicants whose native language is not English must score at least 550 on the Test of English as a Foreign Language (TOEFL).
- e. Some departments may have more restrictive requirements.

University Graduate Regulations

See the University Graduate Regulations section of this catalog.

Course work more than five years old cannot be used to satisfy degree requirements unless waived by the Dean of Engineering.

Half of the course work must be at the 6000 level.

MASTER OF SCIENCE IN ENGINEERING — M.S.E.

Advanced professional engineering competencies are achieved through the Master of Science in Engineering program. This program is intended for those who have attained a bachelor's degree in the engineering discipline in which they wish to continue study at the graduate level. The M.S.E. degree program consists of a core requirement which maintains breadth in a discipline and also an in-depth specialization in a subdiscipline area.

M.S.E. options are offered by the following departments:

M.S.E. options

Civil Engineering:
Computer Engineering:
Electrical Engineering:
Environmental Engineering:
Industrial Engineering:
Manufacturing Engineering:
Mechanical Engineering:

Engineering Departments

Civil & Environmental Engineering
Computer Engineering
Electrical Engineering
Civil & Environmental Engineering
Industrial Engineering & Management Systems
Industrial Engineering & Management Systems
Mechanical & Aerospace Engineering

M.S.E. Degree Requirements

THESIS OPTION

All programs offer the M.S.E. degree with a thesis option which requires a minimum of 24 semester hours of course work, exclusive of research, plus 6 hours in thesis credit. One half of the minimum requirements of the program of study must be in courses at the 6000 level. A thesis must be completed for library publication. Oral defense of the thesis is required. A comprehensive examination may also be required by the department.

COURSE WORK ONLY OPTION

Some departments offer the M.S.E. with a non-thesis, course work only option. This option requires a minimum of 36 semester hours of course work, at least 15 hours of which must be at the 6000 level. A final comprehensive examination of course material, oral and/or written, is required.

ENGINEER INTERN EXAMINATION

The Engineer Intern Examination, conducted by the Florida Board of Professional Engineers or equivalent, must be taken as part of the degree requirements for the M.S.E.

M.S.E. Options

DEPARTMENTAL CORE COURSE REQUIREMENTS

Each student will select, with the approval of his graduate committee, departmental core courses as noted below for the professional options. Additional course work may be selected in one of the subdiscipline specialty areas to provide program depth. The student is referred to the course description section of the catalog for further information.

Civil Engineering (M.S.C.E.)

The core requirements will be met by the following courses offered by the Department of Civil and Environmental Engineering.

a.	CES	6606	Steel Design	3 hours
			or	
	CES	6706	Concrete Design	3 hours
b.	CWR	6235	Open Channel Hydraulics	3 hours
c.	CEG	5015	Geotechnical Engineering II	3 hours
d.	TTE	5205	Traffic Engineering	3 hours
			or	
	TTE	5805	Geometric Design of Transportation Systems	3 hours
e.	CES	5143	Matrix Structural Analysis	
			or	
	CEG	6115	Foundation Engineering	3 hours

A thesis is required for this option.

Computer Engineering (M.S.Cp.E.)

Admission requirements: An engineering baccalaureate degree from an ABET-accredited engineering school. NOTE: The same prerequisites are required as shown for the M.S. degree in Computer Systems. A minimum GPA of 3.0 (A = 4.0) over the last 60 hours of the undergraduate degree and a minimum of 1000 on the GRE are required. The core requirements for all students will be met by the following courses offered as an interdisciplinary program.

ECM	5505	Microcomputer-based Monitoring and Control Systems	3 hours
ECM	5806	Software Engineering I	3 hours
ECM	5365	Introduction to Digital Systems	3 hours

In addition to a thesis, the remaining courses should be chosen from the areas of computer architecture, software engineering, intelligent systems and simulation. A graduate committee must be formed and a chair chosen before non-core courses may be taken. Non-core courses taken *before* a student is in regular status and has a graduate committee may *not* be accepted towards the M.S.E. in Computer Engineering. There is no coursework only option in this program.

Electrical Engineering (M.S.E.E.)

Admission requirements: B.S.E.E. or B.S.E. with an option in Electrical Engineering. A minimum GPA of 3.0 (A = 4.0) over the last 60 hours of the undergraduate degree and a minimum of 1000 on the GRE are required.

Thesis Option

- At least 6 credits from one of the following specialization areas:
 - Controls
 - Communication
 - Digital Signal Processing
 - EM Fields
 - Electronics
 - Electro-optics
 - Solid State and Microelectronics
- One course from any other 3 areas listed in Part a (9 hours total).
- No more than 6 credits of thesis will count toward the degree requirement.
- 9 credits in any area of interest, inside or outside the department, in an approved program of study.

NOTE: 15 credits, at least, must be from 6000-level courses.

Course Work Only Option

This consists of 36 hours of course work and is intended primarily for part-time graduate students. The student's program will satisfy the following requirements:

- At least 15 out of the 36 hours must be at the 6000 level.
- At least 6 credits in one of the following areas of specialization:
 - Controls
 - Communications
 - Digital Signal Processing
 - Electromagnetic Fields
 - Electronics
 - Electro-Optics
 - Solid State and Microelectronics
- One course from any other three areas listed in part b (9 hours total).
- The remainder of the courses, 21 hours, will be chosen in conjunction with an advisor, in an approved program of study. No more than 12 credits outside the area of electrical engineering may be taken. An oral comprehensive examination will be given at the end of the student's program.

Environmental Engineering (M.S.Env.E)

The student will take the following Environmental Engineering core and specialty courses offered by the Department of Civil and Environmental Engineering.

- CWR 5545 Water Resources Engineering 3 hours

b. ENV	6015	Physical/Chemical Treatment Systems	3 hours
c. ENV	6016	Biological Treatment Systems	3 hours
d. ENV	6558	Industrial Waste Treatment	3 hours
e. ENV	6106	Atmospheric Pollution Control	3 hours
		or	
ENV	6126	Design of Air Pollution Controls	3 hours
f. A thesis is required for this option.			

Industrial Engineering (M.S.I.E.)

30 Semester Hours

This degree requires a Bachelor of Science in Industrial Engineering as a prerequisite. The requirements for all students will be met by the following courses.

EIN	5602C	Expert Systems in Industrial Engineering	3 hours
EIN	6140	Project Engineering	3 hours
EIN	6357	Advanced Engineering Economics Analysis	3 hours
EIN	6971	Thesis (required)	6 hours
ESI	5531	Discrete System Simulation	3 hours
ESI	6427	Mathematical Programming I	3 hours
STA	5205	Experimental Design	3 hours

Manufacturing Engineering (M.S.Mfg.E.)

30 Semester Hours

This option is designed for students who have an undergraduate degree in Industrial Engineering or an allied engineering discipline. Students who have not had the following courses or their equivalents must take them as prerequisites:

Prerequisites

Operations Research (ESI 4312)*
 Manufacturing Engineering (EIN 4391)
 Computer Aided Manufacturing (EIN 4411)
 Work Measurement and Design (EIN 3314C)
 Industrial Control Systems (EIN 4332)
 Engineering Economic Analysis (EGN 3613)
 Probability and Statistics for Engineers (STA 3032)*

*These requirements may be met by taking ESI 5316 and STA 5156 as part of the program of study.

The requirements for all students will be met by the following courses:

EIN	5395	Tool Engineering and Manufacturing Analysis	3 hours
		or	
EIN	6418C	Electronics Manufacturing	3 hours
EIN	5602C	Expert Systems in Industrial Engineering	3 hours
EIN	6392C	Manufacturing Systems	3 hours
EIN	6417	Precision Engineering	3 hours
EIN	6605C	Robotics in Industry	3 hours
EIN	6607C	Computer Numerical Control	3 hours
EIN	6971	Thesis	6 hours
		Electives	6 hours

Mechanical Engineering (M.S.M.E.)

The core requirement will be satisfied by the following:

a. EML	6237	Advanced Mechanics of Materials	3 hours
b. EML	6271	Dynamics	3 hours
		or	
c. EML	5713	Intermediate Fluid Mechanics	3 hours
d. EML	5152	Intermediate Heat Transfer	3 hours
e. EML	6104	Classical Thermodynamics	3 hours
		and	

f. One advanced mathematics and one advanced computer related course 6 hours

A thesis is required in this option. EAS 6xxx Finite Elements in Aerospace Systems or EML 6725 Computational Fluid Mechanics may be used to satisfy the advanced computer course requirement.

MASTER OF SCIENCE — M.S.

The Master of Science graduate program is designed to provide the competent student in engineering or other selected fields an opportunity to specialize in a particular subject area within engineering. Normally this objective may be attained through the satisfactory completion of graduate-level course work and research endeavor. A grade point average of "B" must be maintained in all required articulation courses.

Each department and program in the college offers one or more Master of Science options as shown in the department listings below.

Department of Civil & Environmental Engineering

- Construction
- Environmental Sciences
- Structures & Foundations
- Transportation Systems

Department of Electrical Engineering & Communication Sciences

- Electrical Systems and Sciences

Department of Computer Engineering

- Computer Systems
- Engineering System Analysis

Department of Industrial Engineering & Management Systems

- Computer Integrated Manufacturing
- Engineering Management
- Operations Research
- Product Assurance Engineering
- Simulation Systems

Department of Mechanical & Aerospace Engineering

- Aerospace Systems
- Materials Science & Engineering
- Mechanical Systems
- Thermo-Fluids

M.S. Degree Requirements

THESIS OPTION

All programs offer the M.S. degree with a thesis option which requires a minimum of 24 semester hours of course work, exclusive of research, plus 6 hours registration in thesis credit. At least 15 hours must be in courses at or above the 6000 level. A comprehensive examination may also be required by the department. An articulation program may be required prior to admission to regular status.

COURSE WORK ONLY OPTION

Some departments offer the M.S. with a non-thesis, course work only option. This option requires a minimum of 36 semester hours of course work, 15 hours of which must be at the 6000 level. A final comprehensive examination of course material, oral and/or written, is required. An articulation program may be required prior to admission to regular status.

M.S. Option Requirements

Aerospace Systems (M.S.)

30-36 Semester Hours

This option is offered by the Department of Mechanical and Aerospace Engineering as a thesis (30 hours) or course work only (36 hours) program. An individual program is developed with the faculty advisor.

Prerequisites:

Mathematics through Differential Equations (MAP 3302)
Programming and Numerical Methods (CGS 3422)
Aerodynamics (EAS 3101)
Flight Mechanics (EAS 4105)
Flight Structures (EAS 4200)
Aerothermodynamics of Propulsion Systems (EAS 4300)

Required Courses

15 Semester Hours

EAS 6123	Advanced Aerodynamics	3 hours
EAS 6237	Advanced Mechanics of Materials	3 hours
EAS 6405	Advanced Flight Dynamics	3 hours

One advanced mathematics course and one advanced computer course. EAS 6xxx Finite Elements in Aerospace Systems I or EML 6725 Computational Fluid Mechanics may be used to satisfy the advanced computer course requirement.

Representative Electives:

15-21 Semester Hours

EML 6227	Finite Elements in Aerospace Systems I	3 hours
EML 6228	Finite Elements in Aerospace Systems II	3 hours
EML 6725	Computational Fluid Mechanics	3 hours
EML 6402	Turbomachinery	3 hours
EML 6710	Advanced Gas Dynamics	3 hours
EML 6124	Two-Phase Flow	3 hours
EML 5224	Acoustics	3 hours
EML 5352	Computer-Aided Design for Manufacture	3 hours
EML 5454	Photovoltaics	3 hours
EML 6305	Experimental Mechanics	3 hours
EML 6311	System Control	3 hours
EML 6547	Engineering Fracture Mechanics in Design	3 hours
EML 6223	Advanced Vibrational Systems	3 hours
EML 6971	Thesis	6 hours

Computer Integrated Manufacturing (M.S.)

30-36 Semester Hours

This option is available with thesis (30 hours) or without (36 hours) thesis. It is designed for students who have an undergraduate degree in Engineering, Mathematics, computer Science, or allied fields. An individual program of study is developed with the student's faculty advisor but must conform to the following guidelines:

Prerequisites:

Higher level programming language and microcomputer familiarity
Mathematics through Differential Equations (MAP 3302)
Probability and Statistics for Engineers (STA 3032)*
Engineering Economic Analysis (EGN 3613)
Manufacturing Engineering (EIN 4391)
Computer Aided Manufacturing (EIN 4411)
Operations Research (ESI 4312)*

*These requirements may be met by taking ESI 5316 and STA 5156 as part of the program of study.

Required Courses			18 Semester Hours
EIN	5602C	Expert Systems/AI in Industrial Engineering	3 hours
EIN	6392C	Manufacturing Systems	3 hours
EIN	6418C	Electronics Manufacturing	3 hours
EIN	6605C	Robotics in Industry	3 hours
EIN	6607C	Computer Numerical Control	3 hours
ESI	6225	Quality Assurance	3 hours

Representative Electives*			12-18 Semester Hours
ECM	5505C	Microcomputer-based Monitoring & Control Systems	3 hours
ECM	5506C	Engineering Applications of Computer Graphics	3 hours
EIN	5117	Management Information Systems	3 hours
EIN	5383	Network Analysis	3 hours
EIN	5415	Tool Engineering and Manufacturing Analysis	3 hours
EIN	6425	Scheduling and Sequencing	3 hours
EIN	6140	Project Engineering	3 hours
EIN	6258C	Ergonomics in Hi-Tech Environments	3 hours
EIN	6337	Production and Inventory Control	3 hours
EIN	6339	Productivity Engineering	3 hours
EIN	6357	Advanced Engineering Economics Analysis	3 hours
EIN	6417	Precision Engineering	3 hours
EIN	6330	Quality Control in Automation	3 hours
EIN	6603	Readings in Expert Systems/AI	3 hours
EIN	6907	Surface Design and Manufacture	3 hours
ESI	5236	Reliability Engineering	3 hours
ESI	5531	Discrete Systems Simulation	3 hours

*Additional subdiscipline specialty courses and appropriate courses may be selected to meet the individual professional needs for each student.

Computer Systems (M.S.) 30 or 36 Semester Hours

This option (offered by the Department of Computer Engineering) is designed for students with an undergraduate degree in engineering, mathematics, computer science, or a basic science. An individual program of study is developed with a faculty advisor and is required to conform to the following guidelines:

Prerequisites

Mathematics through Differential Equations (MAP 3302)
 Assembly Language Programming (ECM 4508C)
 Probability and Statistics (STA 3032)
 FORTRAN Programming (EGN 3420 or CGS 3422)
 Digital Logic Circuits (EEL 3342)

Required Courses 9 Semester Hours

ECM	5365	Introduction to Digital Systems	3 hours
ECM	5505	Microcomputer-based Monitoring and Control Systems	3 hours
ECM	5806	Software Engineering I	3 hours

A graduate committee must be formed and a chair chosen *before* non-required courses may be taken. Non-required courses taken before a student is in regular status and has a graduate committee may not be accepted towards the M.S. in Computer Systems.

Restricted Electives 9 Semester Hours

Select *one* of the following groups:

a. Computer Architecture

ECM	6765	Computer Systems Design	3 hours
ECM	6717	Digital Computer Systems	3 hours
ECM	6308	Current Topics in Parallel Processing	3 hours

b. Expert Systems and Machine Intelligence

ECM	5431	Expert Systems and Knowledge Engineering	3 hours
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ECM	5453	Pattern Recognition or	3 hours
ECM	5441	Image Processing	3 hours
ECM	6455	Machine Perception	3 hours
c. Software Engineering			
ECM	6807	Software Engineering II	3 hours
ECM	5506	Engineering Applications of Computer Graphics	3 hours
ECM	6426	Continuous System Simulation	3 hours

Electives

12-18 Semester Hours

Construction Engineering (M.S.)

30 Semester Hours

The Construction Engineering program in the Department of Civil and Environmental Engineering is structured to give the student a better understanding of Construction Engineering Principles. The undergraduate courses provide background in structures, construction materials, soils in construction and form work design. At the graduate level, a wide range of course work is available in Construction Law, Project Management, Construction Equipment and Methods, Construction Flow Network, Wood Design and Preliminary Design of Mechanical and Electrical Systems. The above list of topics provides the necessary knowledge for a student to be a part of the construction industry in engineering.

Prerequisites

The student in this program should have background or course work in the following areas:

- Hydraulics (CWR 4201)
- Mathematics through Differential Equations (MAP 3302)
- Probability and Statistics (STA 3032)
- Engineering Economics (EGN 3613)
- Mechanics of Materials (EGN 3331)
- Operations Research (EGN 4634)
- Transportation Engineering (TTE 4004)
- Structural Engineering Analysis (CES 4102)
- Structural Steel or Concrete Design (CES 4605 or CES 4702)
- Construction Engineering I (CCE 4004)
- Geotechnical Engineering (CEG 4101C)

Required Courses

15 Semester Hours

CCE	5035	Construction Law and Project Management	3 hours
CCE	6506	Construction Networking Techniques	3 hours
CES	6606	Steel Design or	
CES	6706	Concrete Design	3 hours
CCE	5005	Construction Engineering II	3 hours
CCE	6505	Construction of Buildings System Techniques Wood Engineering	3 hours

Restricted Electives (example)

9 Semester Hours

CEG	5015	Geotechnical Engineering II	3 hours
EIN	6357	Engineering Economic Analysis	3 hours
TTE	5120	Geometric Design of Transportation	3 hours

Thesis

6 Semester Hours

Additional subdiscipline specialty courses and appropriate support courses are selected to meet the individual professional needs for each student.

Electrical Systems and Sciences (M.S.)

Thesis Option

Admission requirements: A minimum GPA of 3.0 ($A = 4.0$) in the last 60 hours of the undergraduate degree and a minimum of 1000 on the GRE are required.

This option is available to students with a baccalaureate degree in engineering, physics, mathematics or computer sciences who wish to specialize in a particular area of electrical engineering. Students must show completion of the following basic undergraduate courses

(or equivalent) prior to taking graduate courses in their M.S. program. Articulation course requirements for M.S.:

- Mathematics through Differential Equations (MAP 3302)
- Physics with Calculus (PHY 3048, PHY 3049)
- Electronics (EEL 3307)
- Communications (EEL 3552)
- EM Fields (EEL 3470)
- Digital Systems (EEL 3342)

Additional courses may also be required to correct any undergraduate course deficiencies.

Students with outstanding academic records in baccalaureate work other than engineering, physics, mathematics, or computer science may be admitted in special cases. These students will be required to take additional articulation courses tailored to their interest and background.

A "B" average must be maintained in all articulation courses.

In addition to the articulation courses, the student, with the approval of the Graduate Committee, will select courses in electrical engineering or related fields that satisfy the same requirements as the M.S.E.E. thesis option.

Course Work Only Option

This consists of 36 hours of course work and is intended primarily for part-time graduate students. The student's program will satisfy the following requirements:

- a. Articulation course requirements as stated under the M.S. Electrical Systems and Sciences thesis option.
- b. Course work requirements as stated under M.S.E.E. course work only option.

Engineering Management (M.S.)

30-36 Semester Hours

This program (offered by the Department of Industrial Engineering & Management Systems) is designed for technically qualified individuals who plan to assume a management role in project- or program-oriented environments in industry or government. It provides the skills to bridge the gap between a technical specialty and technical management. This option is available with thesis (30 credit hours) or without thesis (36 credit hours).

Prerequisites

- Engineering Economics Analysis (EGN 3613)
- Mathematics through Differential Equations (MAP 3302)
- High level computer language and microcomputer familiarity
- Accounting for Engineers (APA 3471)

Required Courses

21 Semester Hours

STA	5156	Probability and Statistics for Engineers	3 hours
EIN	5117	Management Information Systems	3 hours
EIN	6357	Advanced Engineering Economic Analysis	3 hours
EIN	6140	Project Engineering	3 hours
EIN	5602C	Expert Systems in Industrial Engineering	3 hours
EIN	6322	Engineering Management	3 hours
ESI	5316	Operations Research	3 hours
EIN	6971	Thesis (optional)	6 hours

Representative Electives

3-15 Semester Hours

ACG	5005	Financial Accounting Concepts	3 hours
ACG	5435	Accounting Control Systems	3 hours
ECO	5005	Economic Concepts	3 hours
ECP	6205	Labor Economics	3 hours
EIN	5248C	Ergonomics	3 hours
EIN	6215	Systems Safety Engineering and Management	3 hours
EIN	5388	Forecasting	3 hours
EIN	6339	Productivity Engineering	3 hours
EIN	6933	Systems Acquisition	3 hours

ESI	5236	Reliability Engineering	3 hours
ESI	6224	Quality Management	3 hours
ESI	6225	Quality Assurance	3 hours
FIN	5405	Financial Concepts	3 hours
MAN	5051	Management Concepts	2 hours
MAN	6055	Planning & Control Analysis	3 hours
MAN	6121	Group Decisions & Analysis	3 hours
MAN	6206	Organizational Behavior & Development	3 hours

Engineering Systems Analysis (M.S.)

30-36 Semester Hours

This program (offered by the Department of Computer Engineering) is designed for students with an undergraduate degree in engineering, mathematics, or science with an interest in the systems and control area. An individual program of study is developed with a faculty advisor and is required to conform to the following guidelines:

Prerequisites

Mathematics through Differential Equations (MAP 3302)
 Engineering Analysis (ECM 3420)
 Engineering Applications of Computer Methods (ECM 4301)
 Linear Control Systems (EEL 4567)

Required Courses

12 Semester Hours

EEL	5173	Signals and Systems	3 hours
EEL	5630	Digital Control Systems I	3 hours
ECM	6426	Continuous System Simulation	3 hours
ECM	6428	Topics in Real Time Simulation	3 hours

Restricted Technical Electives

6 Semester Hours

Choose at least two courses:

ECM	5505C	Microcomputer-based Control Systems	3 hours
ECM	5135	Engineering Math Analysis I	3 hours
ECM	5431	Expert Systems and Knowledge Engineering	3 hours
EEL	6502	Adaptive Digital Signal Processing	3 hours
EEL	6621	Nonlinear Control Systems	3 hours
EEL	6671	Modern and Optimal Control Systems	3 hours

Electives

12-18 Semester Hours

Additional subdiscipline-specialty courses are selected and often include appropriate support courses to meet the individual professional needs for each student.

Environmental Sciences (M.S.)

30 Semester Hours

This option (offered by the Department of Civil and Environmental Engineering) is offered to students with appropriate science baccalaureate degrees. The student entering this program should have background (or articulation course work) in the following areas:

Prerequisites

Mathematics through Differential Equations (MAP 3302)
 Fluid Mechanics (EGN 3353)
 Engineering and Environment (EGN 3704)
 FORTRAN Programming (COP 3215)
 Engineering Economics (EGN 3613)
 Probability and Statistics (STA 3032)
 Hydrology and Hydraulics (ENV 4403, ENV 4404)
 Environmental Engineering — Process Design (ENV 4561)
 Chemical Process Control (EES 4202)
 Biological Process Control (EES 4111)
 Atmospheric Pollution Control (ENV 4121)
 Solid and Hazardous Wastes (ENV 4341)

Required Courses (Selected from the following)			12 Semester Hours	
a. CWR	5545	Water Resources Engineering	3 hours	
		or		
	CWR	6235	Open Channel Hydraulics	3 hours
		or		
	CWR	6125	Groundwater Hydrology	3 hours
b. ENV	6015	Physical/Chemical Treatment Systems	3 hours	
		or		
	ENV	6016	Biological Treatment Systems	3 hours
		or		
	ENV	6558	Industrial Waste Treatment	3 hours
c. ENV	6106	Theory and Practice of Atmospheric Dispersion Modeling	3 hours	
		or		
	ENV	6126	Design of Air Pollution Controls	3 hours
d. ENV	5615	Environmental Impact Assessment	3 hours	
		or		
	ENV	6616	Receiving Water Impacts	3 hours
		or		
	ENV	6519	Aquatic Chemical Processes	3 hours

Electives

12-15 Semester Hours

The remaining course work is selected from subdiscipline courses.

Thesis

6 Semester Hours

Materials Science and Engineering (M.S.)

30-36 Semester Hours

This option is offered by the Department of Mechanical and Aerospace Engineering as a thesis (30 hours) or non-thesis (36 hours) program. It is designed for students with a baccalaureate degree in Mechanical Engineering or related programs and is intended to provide strong concentration in materials science and engineering. An individual program of study is developed with a faculty advisor.

Prerequisites:

Mathematics through Differential Equations (MAP 3302)
 Programming and Numerical Methods (CGS 3422)
 Structure and Properties of Materials (EGN 3365C)
 Fundamentals of Chemistry for Engineers (CHS 1440)
 Physics for Engineers and Scientists I and II (PHY 3048 and PHY 3049)
 Experimental Techniques in Materials Engineering (EMA 3012L)
 Mechanics of Materials (EGN 3331) or Thermodynamics (EGN 3343)

Required Courses

12 Semester Hours

EMA	5126	Physical Metallurgy	3 hours
EMA	5326	Corrosion and Electrochemical Engineering	3 hours
EMA	6628	Materials Failure Analysis	3 hours
EML	6237	Advanced Mechanics of Materials	3 hours

Representative Electives

18-24 Semester Hours

EAS	6227	Finite Elements in Aerospace Systems I	3 hours
EAS	6228	Finite Elements in Aerospace Systems II	3 hours
CES	6218	Structural Stability	3 hours
ECM	5506C	Engineering Applications of Computer Graphics	3 hours
EEL	5355C	Fabrication of Solid State Devices	4 hours
EEL	5451L	Electro-Optics Laboratory	3 hours
EGM	5584	Biomechanics and Biomaterials	3 hours
EGM	6611	Continuum Mechanics	3 hours
EGM	6653	Theory of Elasticity	3 hours
EIN	6392	Manufacturing Systems	3 hours
EMA	5108	Surface Science	3 hours

EMA	5140	Introduction to Ceramic Materials	3 hours
EMA	5163	Polymer Sciences & Engineering	3 hours
EMA	5304	Scanning Electron Microscopy	3 hours
EMA	5626	Mechanical Metallurgy	3 hours
EMA	6136	Diffusion in Solids	3 hours
EMA	6504	Modern Characterization Techniques for Materials	3 hours
EML	5152	Intermediate Heat Transfer	3 hours
EML	5224	Acoustics	3 hours
EML	5245	Tribology	3 hours
EML	5532	Computer-Aided Design for Manufacture	3 hours
EML	5546	Engineering Design with Composite Materials	3 hours
EML	5713	Intermediate Fluid Mechanics	3 hours
EML	6305	Experimental mechanics	3 hours
EML	6547	Engineering Fracture Mechanics in Design	3 hours
EML	6971	Thesis	6 hours

Mechanical Systems (M.S.)

30-36 Semester Hours

This option is offered by the Department of Mechanical and Aerospace Engineering Sciences as a thesis (30 hours) or course work only (36 hours) program. An individual program is developed with a faculty advisor.

Prerequisites

Mathematics through Differential Equations (MAP 3302)
 Programming and Numerical Methods (CGS 3422)
 Kinematics (EML 3262)
 Vibration Analysis (EML 4220)
 Machine Design (EML 3500)

Required Courses

12 Semester Hours

EML	6237	Advanced Mechanics of Materials	3 hours
EML	6271	Dynamics	3 hours

One advanced mathematics and one advanced computer course.

EAS 6227 Finite Elements in Aerospace Systems I or EML 6725

Computational Fluid Mechanics may be used to satisfy the advanced computer course requirement.

6 hours

Representative Electives

18-24 Semester Hours

EGM	5584	Biomaterials	3 hours
EGM	6611	Continuum Mechanics	3 hours
EGM	6653	Theory of Elasticity	3 hours
EML	5224	Acoustics	3 hours
EML	5245	Tribology	3 hours
EML	5532	Computer-Aided Design for Manufacture	3 hours
EML	5546	Engineering Design with Composite Materials	3 hours
EML	6223	Advanced Vibrational Systems	3 hours
EML	6226	Analytical Dynamics	3 hours
EML	6279	Synthesis of Mechanisms	3 hours
EML	6306	Advanced Engineering Instrumentation	3 hours
EML	6311	System Control	3 hours
EML	6305	Experimental Mechanics	3 hours
EML	6531	Mechanical Behavior of Materials	3 hours
EML	6547	Engineering Fracture Mechanics in Design	3 hours
EML	6971	Thesis	6 hours

Operations Research (M.S.)

30-36 Semester Hours

This program (offered by the Department of Industrial Engineering and Management Systems) is available with thesis (30 credit hours) or without thesis (36 credit hours). It is designed for students who have an undergraduate degree in engineering, mathematics, or science. An individual program of study is developed with a faculty advisor and must conform to the following guidelines:

Prerequisites

Engineering Economic Analysis (EGN 3613)

Operations Research (ESI 4312)*

Mathematics through Differential Equations (MAP 3302)

Probability and Statistics for Engineers (STA 3032)*

Higher level computer programming and microcomputer familiarity

*These requirements may be met by taking ESI 5316 and STA 5156 as part of the program of study.

Required Courses

15 Semester Hours

EIN	5602C	Expert Systems in Industrial Engineering	3 hours
ESI	5531	Discrete Systems Simulation	3 hours
ESI	6427	Math Programming I	3 hours
STA	5205	Experimental Design	3 hours
EIN	6971	Thesis (Optional)	6 hours

Representative Electives

15-21 Semester Hours

EIN	5383	Network Analysis	3 hours
EIN	5388	Forecasting	3 hours
EIN	6357	Advanced Engineering Economic Analysis	3 hours
EIN	6649	Intelligent Simulation Training System Design	3 hours
EIN	6645	Modeling and Simulation of Real Time Processes	3 hours
EIN	6647	Intelligent Simulation	3 hours
EIN	6317	Training Systems Engineering	3 hours
ESI	5236	Reliability Engineering	3 hours
ESI	6217	Statistical Aspects of Digital Simulation	3 hours
ESI	6336	Queuing Systems	3 hours
ESI	6437	Mathematical Programming I	4 hours
ESI	6532	Object-oriented Simulation	3 hours
STA	5825	Stochastic Process and Applied probability Theory	3 hours
STA	6106	Statistical Computing	3 hours
STA	6707	Multivariate Statistical Analysis	3 hours

Product Assurance Engineering (M.S.)

30-36 Semester Hours

This option (offered by the Department of Industrial Engineering and Management Systems) is designed for students who have an undergraduate degree in engineering or a closely related discipline. The program is designed to provide the student with the necessary knowledge in Product Assurance Engineering to plan, implement, and supervise the product assurance function in government, military, or individual organizations. The program is available with thesis (30 hours) or without thesis (36 hours).

Prerequisites:

Mathematics through Differential Equations (MAP 3302)

Manufacturing Engineering (EIN 4391)

Operations Research (ESI 4312)*

Probability and Statistics for Engineers (STA 3032)

*These requirements may be met by taking ESI 5316 and STA 5156 as part of the program of study.

Required Courses

21 Semester Hours

EIN	5602C	Expert Systems in Industrial Engineering	3 hours
EIN	6140	Project Engineering	3 hours
EIN	6392C	Manufacturing Systems	3 hours
ESI	5236	Reliability Engineering	3 hours
ESI	6224	Quality Management	3 hours
ESI	6225	Quality Assurance	3 hours
STA	5205	Experimental Design and Response Surface Methodology	3 hours
EIN	6971	Thesis (Option)	6 hours

Representative Electives

6-15 Semester Hours

ECM	5505C	Microcomputer-Based Monitoring and Control Systems	3 hours
ECM	5806	Software Engineering I	3 hours
EIN	5117	Management Information Systems	3 hours
EIN	5248C	Ergonomics	3 hours
EIN	5382	Engineering Logistics	3 hours
EIN	6258C	Ergonomics in Hi Tech Environment	3 hours
EIN	6270C	Work Physiology	3 hours
EIN	6398	Productivity Engineering	3 hours
EIN	6605C	Robotics in Industry	3 hours
EIN	6607C	Computer Numerical Control	3 hours
EIN	6607C	Computer Numerical Control	3 hours
EIN	6933	Systems Acquisition	3 hours
ESI	5531	Discrete Systems Simulation	3 hours
STA	5825	Stochastic Processes and Applied Probability Theory	3 hours
STA	6106	Statistical Computing	3 hours
STA	6236	Regression Analysis	3 hours

Simulation Systems (M.S.)

30-36 Semester Hours

As a result of the rapid pace of technological development in computers, graphics, and image processing, there is an increasing tendency to resort to the use of simulators and simulation models to assist in training and the transfer of knowledge. The Master of Science degree in Simulation Systems is designed to prepare individuals with undergraduate degrees in engineering, mathematics, or science for careers in the simulation field. A program of study is developed for each student with the assistance of a Faculty Advisor and Graduate Committee. Students will have an opportunity for first-hand experience in the simulation field through the UCF Institute for Simulation and Training. This program is available with thesis (30 credit hours) or without thesis (36 credit hours).

Prerequisites

Mathematics through Differential Equations (MAP 3302)

Probability and Statistics (STA 3032)*

Computer Programming

*May be satisfied by taking STA 5156 as part of the program of study.

Core Courses

24 Semester Hours

EIN	6140	Project Engineering	3 hours
INP	6605	Training and Performance Appraisal	3 hours
EME	6613	Instructional Systems Design	3 hours
ESI	5531	Discrete Systems Simulation	3 hours
ECM	6426	Continuous Systems Simulation	3 hours
EIN	5255	Training Simulator Engineering	3 hours
EIN	5382	Engineering Logistics	3 hours
EIN	5602C	Expert Systems in Industrial Engineering	3 hours
EIN	6971	Thesis (optional)	6 hours

Representative Electives

6-12 Semester Hours

These courses, or others from the University catalog, are selected with the approval of the student's committee to reflect special interests. Representative courses might include the following:

ECM	5806	Software Engineering I	3 hours
ECM	6807	Software Engineering II	3 hours
ECM	5506	Engineering Applications of Computer Graphics	3 hours
ECM	6441	Computer Image Processing	3 hours
EIN	5248C	Ergonomics	3 hours
EIN	6258	Ergonomics in High Tech Environments	3 hours
EIN	6649	Intelligent Simulation Training System Design	3 hours
EIN	6645	Modeling and Simulation Real Time Processes	3 hours
EIN	6647	Intelligent Simulation	3 hours
EIN	6317	Training Systems Engineering	3 hours

EIN	6933	Systems Acquisition	3 hours
EIN	6971	Thesis	6 hours
EMI	5054	Instructional Technology	3 hours
ESI	5236	Reliability Engineering	3 hours
ESI	6225	Quality Assurance	3 hours
ESI	6259	Advanced System Simulation	3 hours
ESI	6532	Object-oriented Simulation	3 hours
ESI	5236	Reliability Engineering	3 hours
ESI	6225	Quality Assurance	3 hours
ESI	6529	Advanced System Simulation	3 hours

Structures & Foundations (M.S.)

30 Semester Hours

This option (offered by the Department of Civil and Environmental Engineering) is offered to students with appropriate baccalaureate backgrounds. Students should have background (or articulation course work) in the following areas:

Prerequisites

Mathematics through Differential Equations
 Mechanics of Materials (EGN 3331)
 FORTRAN Programming (COP 3215)
 Probability of Statistics (STA 3032)
 Structural Engineering Analysis (CES 4102)
 Structural Steel Design (CES 4605)
 Structural Concrete Design (CES 4702)
 Geotechnical Engineering (CEG 4101)
 Hydraulics (ENV 4404)

Required Courses (Select from the following)

15 Semester Hours

CES	6209	Dynamics of Structures	3 hours
CES	6606	Steel Design	3 hours
CES	6706	Concrete Design	3 hours
CES	5143	Matrix Structural Analysis	3 hours
CEG	6065	Soil Dynamics	3 hours
CEG	6115	Foundation Analysis	3 hours
CEG	5015	Geotechnical Engineering II	3 hours

Electives

9 Semester Hours

Thesis

6 Semester Hours

Thermo-Fluids (M.S.)

30-36 Semester Hours

This option is offered by the Department of Mechanical and Aerospace Engineering as a thesis (30 hours) or course work only (36 hours) program. An individual program is developed with a faculty advisor.

Prerequisites

Mathematics through Differential Equations (MAP 3302)
 Programming and Numerical Methods (CGS 3422)
 Fluid Mechanics (EML 4703)
 Heat Transfer (EML 4142)
 Thermodynamics (EML 3101)

Required Courses

15 Semester Hours

EML	5713	Intermediate Fluid Mechanics	3 hours
EML	5152	Intermediate Heat Transfer	3 hours
EML	6104	Classical Thermodynamics	3 hours

One advanced mathematics and one advanced computer course.

EAS 6227 Finite Elements in Aerospace Systems I or EML 6725

Computational Fluids Mechanics may be used to satisfy the advanced computer course requirement.

6 hours

Representative Electives

15-24 Semester Hours

EML	5105	Statistical Thermodynamics	3 hours
EML	5451	Energy Conversion	3 hours
EML	5454	Photovoltaics	3 hours
EML	5455	Energy Conservation	3 hours
EML	5609	Environmental Thermodynamics	3 hours
EML	6124	Two-Phase Flow	3 hours
EML	6131	Combustion Phenomena	3 hours
EML	6154	Conduction Heat Transfer	3 hours
EML	6155	Convection Heat Transfer	3 hours
EML	6157	Radiation Heat Transfer	3 hours
EML	6402	Turbomachinery	3 hours
EML	6710	Advanced Gas Dynamics	3 hours
EML	6712	Mechanics of Viscous Flow	3 hours
EML	6725	Computational Fluid Mechanics	3 hours
EML	6971	Thesis	6 hours

Transportation Systems (M.S.)

30 Semester Hours

This option (offered by the Department of Civil and Environmental Engineering) is open to students with appropriate baccalaureate backgrounds. Students should have background (or articulation course work) in the following areas:

Prerequisites

Probability and Statistics (STA 3032)
 Operations Research (EGN 4634)
 Transportation Engineering (TTE 4004)
 Urban Systems Engineering (ENV 4651)
 Mathematics through Differential Equations (MAP 3302)

Required Courses

15 Semester Hours

TTE	5205	Traffic Engineering	3 hours
TTE	5805	Design Elements of Transportation Systems	3 hours
CGN	6606	Public Works Engineering	3 hours
TTE	6625	Mass Transportation Systems	3 hours
TTE	6526	Planning and Design of Airports	3 hours

Electives

9 Semester Hours

Thesis

6 Semester Hours

MASTER OF CIVIL ENGINEERING — M.C.E.

This is a professional practice oriented education program with an enhanced design element, nonengineering professional practice courses, and a six-month internship prior to graduation. The curriculum provides support for professional practice and, as such, the graduating student is required to take the Engineering Intern Examination. The program builds directly upon an ABET accredited baccalaureate degree in Civil Engineering. Course work more than five years old cannot be used to satisfy degree requirements unless waived by the Dean of Engineering.

M.C.E. Degree Requirements**REQUIRED COURSES**

12 Semester Hours

Design courses at the graduate level are required, selected from departmental offerings (Prefix CEG, CES, CGN, CWR, EES, ENV or TTE).

ELECTIVES

6 Semester Hours

Engineering science, science, and mathematics courses will be selected with advisor's approval.

PROFESSIONAL EMPHASIS

8 Semester Hours

A coordinated, planned sequence of courses covering nontechnical subject matter pertinent to professional practice in the following subjects.

- a. Engineering professional and ethics
- b. Economics
- c. Finance or Business Management
- d. Law, contracts, and specifications
- e. Natural resources

INTERNSHIP

1 Semester Hour

Six months full-time supervised internship

THESIS

6 Semester Hours

A thesis is required.

EXAMINATION

Students must take the Engineering Intern Examination

Total Minimum Semester Hours Required:

33

DOCTORAL PROGRAM**Doctor of Philosophy Degree — Ph.D.**

The Ph.D. program is primarily intended for those with a master's degree in engineering; but, with appropriate articulation courses, master's degree holders in related disciplines will be able to use the program to study selected engineering disciplines in depth. The graduates of the program are able to meet the highest standards of preparation for leadership in the profession of engineering including research, teaching, and leadership in high technology industry and governmental agencies.

ADMISSION

In addition to satisfying regular University admissions criteria*, students must have a master's degree in engineering or a related discipline awarded by a recognized institution and meet departmental admission requirements. The student must successfully complete a Ph.D. Qualifying Examination conducted by the option department. A student is normally given only one opportunity to pass the qualifying examination, but a second attempt may be approved by the department.

*NOTE: Meeting minimum University admission standards for graduate status may not satisfy doctoral program admission requirements. Additional or higher criteria may be required.

DEGREE REQUIREMENTS

The student's program will consist of a minimum of 84 semester hours of graduate credit.

CORE REQUIREMENT

24 Semester Hours

All three areas listed below must be represented with a minimum of eight hours taken from outside the College of Engineering. The actual courses taken are worked out by the student and his advisory committee and specified in the student's program of study.

- Physical Sciences and Mathematics
- Engineering Sciences
- Management Sciences

OPTION REQUIREMENT

36 Semester Hours

Option courses, normally taken within one discipline, are selected by the student and his advisory committee. The options are:

Civil Engineering
Computer Engineering
Electrical Engineering
Environmental Engineering
Industrial Engineering
Mechanical Engineering

DISSERTATION

24 Semester Hours

Students must have passed the candidacy examination before registering for Dissertation hours.

EXAMINATIONS

The candidacy examination will be taken when the student has finished most of his course work and has identified an area of research for the doctoral dissertation. The examination consists of two parts: (1) a written examination and (2) presentation of a written doctoral research prospectus to the committee and an oral review of the proposal. Upon completion of the dissertation, a successful oral defense of the dissertation must be conducted.

Total Semester Hours for the Ph.D. Degree:

84

FEEDS (Florida Engineering Education Delivery System)

FEEDS is a Florida statewide system whereby graduate level engineering courses are delivered via video tape to cooperating university centers and selected industrial sites. Most graduate courses offered each semester are available through FEEDS. A student taking courses through FEEDS must meet the same requirements as a student on campus and will earn the same credit as if attended on campus. Courses delivered by the system may lead to graduate degrees in engineering.

A student need not be enrolled in a graduate degree program in order to take a FEEDS course. A student who intends to seek admission to a graduate program should be aware that no more than 9 credit hours of courses may be transferred into a degree seeking program.

For information concerning FEEDS, consult the UCF-FEEDS catalog (published each semester) or contact the Director of UCF-FEEDS at (407) 823-2455.

College of Engineering Courses

CCE 5005 Construction Engineering II

3 cr (3,0)

PR: CCE 4004 or C.I. Construction planning, equipment, and methods used in heavy construction.

CCE 5035 Construction Law & Project Management

3 cr (3,0)

PR: C.I. Contracts, specifications, and law for engineers. Strategic planning, management, development, design, and production of construction projects. Value engineering, project funding and cash flow.

CCE 6505 Construction Building System Techniques

3 cr (3,0)

PR: CES 4127 or C.I. Wood engineering techniques and architectural principles in construction. Construction design of mechanical and electrical systems.

CCE 6506 Construction Network Techniques

3 cr (3,0)

PR: EGN 4634 or C.I. Critical path planning and scheduling. Networking techniques. Resource leveling; time cost trade-offs using precedence networks and network cost analysis.

CEG 5015 Geotechnical Engineering II

3 cr (3,0)

PR: ECI 4305. Continuation of ECI 4305 with emphasis on shear strength and design factors for earth pressures bearing capacity, and slope stability.

CEG 5805 Geotechnical Engineering Design

2 cr (1,2)

PR: ECI 4305. Project course on design of foundations and other soil structures using geotechnical design methodologies.

CEG 6065 Soil Dynamics

3 cr (3,0)

PR: CEG 4101. Comprehensive coverage in calculating the dynamic response of foundations, presenting a variety of contemporary techniques for fields and laboratory.

- CEG 6115 Foundation Engineering** **3 cr (3,0)**
 PR: CEG 5015. Analysis and design of spread footings, mat foundations, retaining walls, sheeting and bracing systems and pile foundations.
- CEG 6317 Theoretical Geotechnical Engineering** **3 cr (3,0)**
 PR: CEG 4305. Foundations of theoretical soil mechanics. Concepts of stress, strain, elasticity body, settlement. Stability and limiting equilibrium.
- CEG 6415 Seepage Analysis** **3 cr (3,0)**
 PR: CEG 4101C. Seepage and groundwater flow analysis: levees, earth dams, retention ponds, etc. Appropriate computer programs and engineering applications.
- CES 5143 Matrix Structural Analysis** **3 cr (3,0)**
 PR: CES 4102 or equivalent. Optimization and matrix methods applied to the design of real structures.
- CES 6116 Finite Elements in Structures** **3 cr (3,0)**
 PR: C.I. Applications of the finite element method to the analysis and design of linear and non-linear structural components and systems.
- CES 6129 Analysis of Plates and Shells** **3 cr (3,0)**
 PR: EML 5237 or equivalent. Theory of bending of thin plates. Energy and approximation techniques. Non-linear behavior of plates. Theory of thin shells with small deformations.
- CES 6144 Matrix Methods of Structural Analysis** **3 cr (3,0)**
 PR: CES 5141 or C.I. Structural analysis of beams, frames, and plates using matrix methods and current computer programs.
- CES 6209 Dynamics of Structures** **3 cr (3,0)**
 PR: C.I. Dynamic behavior of linear structures. Natural vibrations of structural systems. Damping in structures. Response to periodic and non-periodic excitations. Emphasis on matrix methods.
- CES 6218 Structural Stability** **3 cr (3,0)**
 PR: EML 5237 or equivalent. Analysis of structural elements, columns, frameworks, lateral stability. Introduction to the stability of plates. Energy and approximate methods.
- CES 6606 Steel Design** **3 cr (3,0)**
 PR: CES 4605 or equivalent. Design of complete steel structures to include economics, plastic design, and real building examples.
- CES 6706 Concrete Design** **3 cr (3,0)**
 PR: CES 4702 or equivalent. Design of concrete structures to include economics, slabs, prestressed concrete, and real building examples.
- CGN 5504 Civil Engineering Materials** **3 cr (2,2)**
 PR: EGN 3365, EGN 3331 or C.I. Structure, properties and applications of materials used in civil engineering including concrete, steel, asphalt, wood, soils, and composite materials.
- CGN 5506 Asphalt Concrete Mix Design** **3 cr (2,2)**
 PR: CEG 4101 Geotech I Properties of asphalt, aggregate and asphalt mixtures, Marshall mix design, Hveem mix design, pavement rehabilitation.
- CGN 6425 Mathematical Modeling in Civil Engineering** **3 cr (3,0)**
 PR: C.I. Development of modeling techniques applied to the analysis of contemporary Civil Engineering problems including transportation, fluid flow, and two-dimensional continuum analysis.
- CGN 6606 Public Works Engineering** **3 cr (3,0)**
 PR: C.I. Principles and practices, operation and maintenance, equipment, utilities, planning and design, etc.
- CGN 6655 Regional Planning, Design, and Development** **3 cr (3,0)**
 PR: ENV 4651. Project course dealing with planning, design, and development of regional systems, including projections, case studies, design alternatives, environmental impact, etc.
- CWR 5205 Hydraulic Engineering** **3 cr (2,3)**
 PR: EGN 3353. Environmental and civil engineering hydraulics application. Pipe and open channel flow, fittings, flow measurements, etc.
- CWR 5545 Water Resources Engineering** **3 cr (3,0)**
 PR: CWR 4101, CWR 4201. Systems identification and solution to complex water allocation problems, and other hydraulic engineering designs and operations using economic analysis and operations research techniques.

- CWR 6125 Groundwater Hydrology** 3 cr (3,0)
PR: CWR 4201 or equivalent. Theories of groundwater movement, geological factors, analysis and design techniques, etc. Emphasis on practical considerations.
- CWR 6235 Open Channel Hydraulics** 3 cr (3,0)
PR: CWR 4201 or C.I. Free surface flow studies by empirical and theoretical methods for the design, operation, and management of open channels.
- EAS 6123 Advanced Aerodynamics** 3 cr (3,0)
PR: EAS 4101 or equivalent. Theoretical methods useful for predicting performance and stability of lifting surfaces and vehicles at subsonic, supersonic and hypersonic speeds.
- EAS 6227 Finite Elements in Aerospace Systems I** 3 cr (3,0)
PR: EML 5237 or EML 5713 or C.I. Finite element analysis of thermomechanical response of aerospace components and structures. Plates and shells. Vibrations. Composite materials. Minimum weight design. CAD interface. Introduction to codes.
- EAS 6228 Finite Elements in Aerospace Systems II** 3 cr (3,0)
PR: Finite Elements I or C.I. Advanced finite element applications to aerospace components and structures. Rotating systems. Fracture mechanics. Aeroelasticity. Bulking. Impact. Use of codes.
- EAS 6405 Advanced Flight Dynamics** 3 cr (3,0)
PR: EAS 4101 or equivalent. Aerodynamic principles as applied to stability and control of aerospace vehicles. Generalized vehicle performance. Small disturbance dynamic stability and control response.
- ECM 5135 Engineering Math Analysis I** 3 cr (3,0)
PR: MAP 3302. Topics in advanced engineering mathematics including systems of differential equations, phase plane, linear algebra, and vector differential calculus.
- ECM 5365 Introduction to Digital Systems** 3 or 3 cr (3,0)
- ECM 5431 Expert Systems and Knowledge Engineering** 3 cr (3,0)
PR: ECM 4451 or C.I. Introduction to Expert Systems in Engineering, expert systems tools and interviewing techniques. This course is hands-on and project-oriented.
- ECM 5441 Image Processing** 3 cr (3,0)
PR: MAP 3302, EGN 3420. Two dimensional signal processing techniques; pictorial image representation; spatial filtering; image enhancement and encoding; segmentation and feature extraction; introduction to image understanding techniques.
- ECM 5453 Pattern Recognition** 3 cr (3,0)
PR: MAP 3302, EGN 3420. Theoretic and syntactic methods of pattern analysis. Decision functions; optimum decision criteria; training algorithms; feature extraction; unsupervised learning; data reduction and potential functions.
- ECM 5505C Microcomputer-based Monitoring and Control Systems** 3 cr (2,3)
PR: EEL 3342; ECM 4508 or C.I. Machine language programming; software development aids; systems design; interfacing considerations.
- ECM 5506C Engineering Applications of Computer Graphics** 3 cr (2,3)
PR: EGN 3420 or C.I. Computer Graphics in Engineering Applications. Laboratory program assignments.
- ECM 5806 Software Engineering I** 3 cr (3,0)
PR: EGN 3420, ECM 4230 or C.I. Design, implementation, and testing of computer software for Engineering applications.
- ECM 6235 Engineering Math Analysis II** 3 cr (3,0)
PR: ECM 5135. Advanced engineering math topics including Fourier series, partial differential equations, and complex variables.
- ECM 6306 Computer Network Design** 3 cr (3,0)
PR: ECM 4509 or C.I. Network types and network protocols. Design of networks and analysis of their performance.
- ECM 6308 Current Topics in Parallel Processing** 3 cr (3,0)
PR: ECM 6765 or C.I. Research topics in parallel architectures, including, but not limited to, systolic architectures, wavefront arrays, interconnection networks, reconfigurable architectures and fast algorithms.

- ECM 6426 Continuous System Simulation** **3 cr (3,0)**
 PR: ECM 4708 or C.I. Use of state-space techniques, numerical integration, and CSSL programs. Laboratory assignments.
- ECM 6427 Continuous System Simulation II** **3 cr (3,0)**
 PR: ECM 6426. Continuation of ECM 6426 including advanced features of Continuous Simulation Languages such as user-defined macros, linear analysis package, sampled data systems. A simulation study term project is required.
- ECM 6428 Current Issues in Real-Time Simulation** **3 cr (3,0)**
 PR: ECM 5506, ECM 6426. Design considerations in real-time, computer based, training simulator systems. Laboratory assignments.
- ECM 6432 Engineering of Artificial Intelligence Systems** **3 cr (3,0)**
 PR: ECM 5431 or C.I. Introduction to the engineering of knowledge-based automated reasoning systems including the use of representation languages and object-oriented techniques. It is based on LISP.
- ECM 6433 Current Topics in Artificial Intelligence in Engineering Systems** **3 cr (3,0)**
 PR: ECM 6432 or C.I. Research in current topics including artificial intelligence, relevant to engineering systems including causal modeling, qualitative reasoning, temporal reasoning and inductive reasoning. Review of current literature.
- ECM 6436 Automata Theory** **3 cr (3,0)**
 PR: COT 3100 or C.I. Structural theory and performance characteristics of the finite-state machines.
- ECM 6455 Machine Perception** **3 cr (3,0)**
 PR: ECM 5441 or ECM 5453 or C.I. Advanced methods of machine understanding; simulation of intelligent machine systems; automatic recognition systems; visual tracking systems; multispectral feature analysis.
- ECM 6457 Machine Intelligence** **3 cr (3,0)**
 PR: ECM 6455. Design and development of intelligent machine systems; decision theory; intelligence modeling; neural models; advanced techniques in applied artificial intelligence.
- ECMC 6459 Introduction to Neural Networks** **3 cr (3,0)**
 PR: ECM 5453 or C.I. Artificial neural network theory, models and architectures. Neurobiological basis, learning theory, applications, and hardware implementation issues.
- ECM 6706 Engineering Data Reduction** **3 cr (3,0)**
 Digital analysis of multidimensional data. Applications of multidimensional orthogonal transforms.
- ECM 6717 Digital Computer Systems** **3 or 3 cr (3,0)**
 PR: ECM 6765 or C.I. Analysis of special purpose computer elements, computers and computer systems. Microprocessor based systems, systems with one or more central or I/O processors, networks of computers.
- ECM 6765 Computer Systems Design** **3 or 3 cr (3,0)**
 PR: ECM 5365 or C.I. Study of digital systems and computer architecture using digital design language. Specification and design of computer systems. Comparison of software and hardware solutions.
- ECM 6805C Microcomputer Applications Design** **3 cr (2,3)**
 PR: ECM 5505C or C.I. Advanced applications of microcomputer systems. Design of systems and software to implement a case study in microcomputer usage.
- ECM 6807 Software Engineering II** **3 cr (3,0)**
 PR: ECM 5806 or equivalent; C.I. Continuation of ECM 5806. Emphasis on term projects and case studies.
- ECM 6811 Software Engineering Quality Assurance Methods** **3 cr (3,0)**
 PR: ECM 5806, ECM 6807. Methods for verification and validation of software quality, including software engineering metrics and models.
- ECM 6813 Software Development for Real-Time Engineering Systems** **3 cr (3,0)**
 PR: ECM 5806, ECM 6807. Issues associated with developing software for real-time systems, including parallel processing, task synchronization, and task scheduling.
- ECM 6815 Software Engineering Life-Cycle Control** **3 cr (3,0)**
 PR: ECM 5806, ECM 6807. Issues in software development life-cycle control including project cost and time estimation, methods and models, manpower allocation, and system configuration management.

- EEL 5173 Signal and System Analysis** **3 cr (3,0)**
 PR: EEL 3122. Continuous and discrete dynamic models; emphasis on state variable models. Laplace, Z-transform and time domain solutions of dynamic model behavior. Real-time digital simulation. Sampling theory.
- EEL 5255** **3 cr (3,0)**
 PR: EEL 4216 or C.I. System modeling, machinery, protection, load flow, stability.
- EEL 5332C Thin Film Technology** **3 cr (2,1)**
 PR: EEL 3306 or equivalent. To present the various thin film deposition techniques for the fabrication of microelectronic, semiconductor and optical devices.
- EEL 5355C Fabrication of Solid-State Devices** **4 cr (3,3)**
 PR: EEL 4308. Fabrication of microelectronic devices, processing technology, ion implantation and diffusion, device design, and layout. Laboratory includes device processing technology.
- EEL 5357 CMOS Analog IC Design** **3 cr (3,0)**
 PR: EEL 3306 and EEL 4709. The objective of this course is to present the principles and techniques of the design of analog circuits that are to be implemented in a CMOS technology.
- EEL 5370C Operational Amplifiers** **3 cr (3,0)**
 PR: EEL 3307C. Ideal and non-ideal Op-Amps. Linear applications. Active RC and switched-capacitor filters. Non-linear and other functional circuits. Frequency stability and compensation of Op-Amps.
- EEL 5434 Microwave Solid-State Devices** **3 cr (3,0)**
 PR: EEL 4436 or EEL 5555. Device and circuit principles of p-n junctions, BJTs, FETs, gunn, IMPATT, TRAPATT, and BARITT diodes.
- EEL 5441 Introduction to Wave Optics** **3 cr (3,0)**
 PR: EEL 4440, or PHY 4424 or C.I. Electromagnetic foundation of light waves as applied to reflection, refraction, diffraction, interference, polarization, coherence, and guided waves.
- EEL 5446 Optical Systems Design** **3 cr (3,0)**
 PR: C.I. Design principles of lens and mirror optical systems; evaluation of designs using computer techniques.
- EEL 5450C Thin Film Optics** **3 cr (2,10)**
 PR: PHY 4424 or EEL 4440 and EEL 5441 or EEL 5451. Principles of thin film optics and its applications in optical electro-optical, and laser systems.
- EEL 5451L Electro-Optics Laboratory** **3 cr (1,4)**
 PR: EEL 3470 or C.I. Study of laboratory techniques for optical measurements and performance of measurements on electro-optic devices to determine operational characteristics.
- EEL 5462C Antenna Analysis and Design** **3 cr (3,1)**
 PR: EEL 3470 or equivalent. Fundamentals of antennas; dipoles, loops, arrays, apertures, and horns. Analysis and design of various antennas.
- EEL 5513 Digital Signal Processing Applications** **3 cr (3,0)**
 PR: EEL 4750. The design and practical consideration for implementing Digital Signal Processing Algorithms including Fast Fourier Transform techniques, and some useful applications.
- EEL 5517 Surface Acoustic Wave Devices and Systems** **3 cr (3,0)**
 PR: EEL 3552C. Course discusses SAW technology which includes the physical phenomenon, transducer design and synthesis, filter design and performance parameters. Actual devices and communication systems are presented.
- EEL 5542 Random Processes I** **3 cr (3,0)**
 PR: EEL 3552C and STA 3032. Elements of probability theory; random variables, and stochastic processes.
- EEL 5555 RF Communications** **3 cr (2,1)**
 PR: EEL 3552C. RF communication systems, 10 MHz to 1500 MHz. Scattering parameters, noise, receiver design, system implementation, spread spectrum. RF network and spectrum analyzers.
- EEL 5563 Fiber Optics Communication** **3 cr (3,0)**
 PR: EEL 3552C, EEL 3470. Use of fiber optics as a communication channel. Principles of fiber optics. Mode theory, transmitters, modulators, sensors, detectors, and demodulators.

- EEL 5630 Digital Control Systems I** **3 cr (3,0)**
 PR: EEL 3342C and EEL 4567. Real time digital control systems analysis and design. Z-transforms, sampling and reconstruction, time and frequency response, stability analysis, digital controller design.
- EEL 6141 Synthesis of Electric Filters** **3 cr (3,0)**
 Analysis and design of electric filters.
- EEL 6338 Advanced Topics in Microelectronics** **3 cr (3,0)**
 PR: C.I. The course covers advanced topics in microelectronics such as semiconductor device physics, semiconductor device fabrication, and semiconductor device modeling.
- EEL 6354 Semiconductor Devices II** **3 cr (3,0)**
 PR: EEL 5355C or C.I. Advanced course in the theory and design of semiconductor devices. Topics include injection, recombination, p-n junctions, FETs, and bipolar devices. Theory and models are developed.
- EEL 6371 Advanced Electronics I** **3 cr (3,0)**
 PR: EEL 5357 or EEL 5370C. Models for integrated-circuit active devices. Analysis and design of IC amplifiers. Feedback amplifiers. Frequency response and stability. Compensation of amplifiers.
- EEL 6372 Advanced Electronics II** **3 cr (3,0)**
 PR: EEL 6371. Advanced topics of current interest in VLSI design.
- EEL 6443 Electro-optics** **3 cr (3,0)**
 PR: EEL 3470, EEL 5441. Principles, design and use of birefringent and periodic electro-optic devices. Nonlinear and phase-conjugate optics.
- EEL 6457 Advanced Topics in Electro-Optics** **3 cr (3,0)**
 PR: C.I. Current research topics in electro-optics, such as optical computing, binary optics, advanced system design issues, novel laser systems, etc.
- EEL 6463 Antenna Analysis and Design II** **3 cr (3,0)**
 PR: EEL 5462C. Moment method, GTD, aperture antennas, reflectors, frequency independent antennas and microstrip antennas.
- EEL 6488 Electromagnetic Fields** **3 cr (3,0)**
 PR: EEL 3470 or C.I. Maxwell's equations. Boundary conditions. Propagation, reflection, and refraction of waves. Guided waves. Radiation.
- EEL 6492 Advanced Topics in Electromagnetics and Microwaves** **3 cr (3,0)**
 PR: C.I. Advanced and current topics in EM fields, antennas, and microwaves.
- EEL 6502 Adaptive Digital Signal Processing** **3 cr (3,0)**
 PR: EEL 5513 or C.I.
- EEL 6504 Communications Systems Design** **3 cr (3,0)**
 PR: EEL 6530. Information and coding theory. Modem design. Binary and M-ary modulations. Intersymbol interference and pulse shaping. DS and FS spread-spectrum systems.
- EEL 6505 Multi-dimensional Digital Processing** **3 cr (3,0)**
 PR: EEL 5513 or C.I.
- EEL 6530 Communication Theory** **3 cr (3,0)**
 PR: EEL 5542 or C.I. Communication in the presence of noise; analog and pulse modulation; use of phase-locked loops, synthesizers, VCOs, system implementations.
- EEL 6537 Detection and Estimation** **3 cr (3,0)**
 PR: EEL 6543. Use of hypothesis testing (Bayes, Minimax, Neyman-Pearson) and estimation theory (Bayes, Maximum-likelihood) for detecting or estimating signals in noise. Application in communications and radar.
- EEL 6543 Random Processes II** **3 cr (3,0)**
 PR: EEL 5542. Stochastic processes. Mean-squared estimation. Queueing theory. Spectral estimation. Applications to communications and radar systems.
- EEL 6558 Advanced Topics in Digital Signal Processing** **3 cr (3,0)**
 PR: C.I. Advanced and current topics in digital signal processing, such as neural network, spectral analysis, speech processing.

- EEL 6560 Laser Engineering** 3 cr (3,0)
PR: EEL 5441 or C.I. Principles of laser amplification and oscillations; design of lasers; general characteristics of excitation systems.
- EEL 6561 Fourier Optics** 3 cr (3,0)
Application of Fourier transform theory to optical systems design. Development of optical correlation techniques. Holographic techniques and applications.
- EEL 6564 Optical Communication Theory** 3 cr (3,0)
PR: EEL 6530 or C.I. Optical communication schemes; Statistical modelling; coherent and non-coherent detection time synchronization channel characterization.
- EEL 6565 Infrared Technology** 3 cr (3,0)
PR: C.I. Analysis of infrared systems radiation theory, sources, atmospheric transmission, detection, noise, materials, optical design, system design.
- EEL 6590 Advanced Topics in Communications** 3 cr (3,0)
PR: C.I. Advanced and current topics in communications, such as coding theory, information theory, spread spectrum, etc.
- EEL 6621 Nonlinear Control Systems** 3 cr (3,0)
PR: EEL 5173. Phase plane descriptions of non-linear phenomena, limit cycles, jump conditions, stability, describing functions, Liapunov and Popov theory, time and frequency domain analysis for non-linear systems.
- EEL 6633 Digital Control Systems II** 3 cr (3,0)
PR: EEL 5630. Modern digital control system analysis and design. State estimation and optimal control. Digital filter structures and microcomputer implementation. Finite wordlength effects.
- EEL 6671 Modern and Optimal Control Systems** 3 cr (3,0)
PR: EEL 5173. The optimal control problem. Necessary conditions for constrained minimums in finite dimensional space. Application to discrete time control problems. Pontryagin conditions and Hamilton-Jacobi equations. Computational considerations.
- EEL 6680 Advanced Topics in Modern Control Systems** 3 cr (3,0)
PR: C.I. To introduce the student to present-day issues in control systems analysis, design, and implementation.
- EEL 6755 VLSI Design of Digital Signal Processors** 3 cr (3,0)
PR: EEL 5173 and EEL 6502 (or C.I.) Signal processing techniques and algorithms as applied to digital filters, detection, and estimation. VLSI design methodology and components are applied to signal processors.
- EGM 5584 Biomechanics and Biomaterials** 3 cr (3,0)
PR: EGN 3363 and EGN 3331. Properties of natural biological materials and their relation to microstructure, biocompatibility, artificial biomaterials and their applications, with analysis of biomechanical forces of the body.
- EGM 6611 Continuum Mechanics** 3 cr (3,0)
PR: EML 5237, EML 4703 or equivalent. Tensors; deformation and strain; stress; field equations, constitutive equations, applications in fluid dynamics and linear elasticity.
- EGM 6653C Theory of Elasticity** 3 cr (3,0)
PR: EML 5237. Review of stress and strain; solution by tensor stress and potential functions, axisymmetric problems; wave propagation.
- EGN 5034 Engineering and Public Works** 3 cr (3,0)
PR: C.I. The purposes, function, and role of engineering within public works.
- EGN 5035 Topics in Technological Development** 3 cr (3,0)
PR: C.I. Selected topics in the technological development of western civilization including the weight-driven clock, steam engine, electric light, etc.
- EGN 5036 Engineering Codes and Standards** 2 cr (2,0)
PR: C.I. Development, history, and function of engineering codes and standards and their use in protecting public health and safety.

- EIN 5117 Management Information Systems I** **3 cr (3,0)**
PR: C.I. Design and implementation of computer-based management information systems. Organizational, managerial, and economic aspects of MIS.
- EIN 5248C Ergonomics** **3 cr (2,2)**
PR: C.I. Applications of anthropometry; functional anatomy, mechanics, and physiology of the musculo-skeletal concepts in the engineering design of industrial tools, equipments and workstations.
- EIN 5255 Training Simulator Engineering** **3 cr (3,0)**
Introduction to significant topics relative to the development and use of simulators for knowledge transfer in the technical environment.
- EIN 5381 Engineering Logistics** **3 cr (3,0)**
Study of the logistics life-cycle involving planning, analysis and design, testing, production, distribution, and support.
- EIN 5382 Engineering Logistics** **3 cr (3,0)**
Study of the logistics life cycle involving planning, analysis and design, testing, production, distribution, and support.
- EIN 5383 Network Analysis** **3 cr (3,0)**
PR: EGN 4634 or ESI 5316. Development, application and computerized analysis of networks for systems and control. Applications of CPM, PERT, GERT, and maximal flow concepts.
- EIN 5388 Forecasting** **3 cr (3,0)**
PR: STA 3032 or STA 5156, ESI 5170. Industrial applications of forecasting methods with emphasis on microcomputer based packages.
- EIN 5415 Tool Engineering and Manufacturing Analysis** **3 cr (3,0)**
PR: EIN 4391 or C.I. Tool materials and design, tolerance technology, theory of metal cutting, and machineability.
- EIN 5602C Expert Systems in Industrial Engineering** **3 cr (2,2)**
Overview of basic concepts, architecture and construction of expert systems in IE. Intelligent simulation training systems, case studies and problems. Laboratory exercises.
- EIN 6425 Scheduling and Sequencing** **3 cr (3,0)**
Basic problems, models and techniques of scheduling. Emphasis on general job shop scheduling problems. Analytical, graphical and heuristic methods are examined.
- EIN 6317 Training Systems Engineering** **3 cr (3,0)**
How human performance deficiencies should be addressed from a systems engineering point of view. Manpower, personnel, and training considerations will be examined.
- EIN 6140 Project Engineering** **3 cr (3,0)**
PR: C.I. Role of engineer in project management, emphasis on qualitative and quantitative techniques in planning, organization supervision, control of projects from conceptual design to field installation; applications via term project.
- EIN 6215 System Safety Engineering and Management** **3 cr (3,0)**
PR: C.I. Occupational injury and accident statistic. Accident investigation and prevention methods. Hazard analysis. Occupational safety and health standards and regulations. Product safety and liability.
- EIN 6249C Biomechanics** **3 cr (2,2)**
PR: EIN 5248C or consent of instructor. Applications of body link system, kinematic aspect of body movement and mechanics of the human body concepts in the engineering design of worksystems.
- EIN 6258 Ergonomics in High Tech Environments** **3 cr (2,2)**
PR: EIN 6249C and EIN 6270C or C.I. Integration of man-machine concepts to the ergonomics applications in the design of physical man-machine properties.
- EIN 6264C Environmental Hygiene and Occupational Health** **3 cr (2,2)**
PR: EIN 5215 or C.I. Evaluation and control of mechanical, physical, and chemical environment. Environments considered include heat, cold, noise, vibration, light pressure, radiation, solid waste, air contaminants, etc.

- EIN 6270C Work Physiology** 3 cr (2,2)
PR: EIN 5248 or C.I. Applications of the concepts of endurance fatigue, recovery and the energy cost of work in the determination of work capacity, job design, personnel assignment, and work/rest scheduling.
- EIN 6322 Engineering Management** 3 cr (3,0)
PR: C.I. Investigate special topics for improvements of engineering enterprises in nationally and internationally competitive environments. Topics may include organization structure, motivation theory, technology management and entrepreneurship.
- EIN 6336 Production & Inventory Control** 3 cr (3,0)
PR: EIN 4333 or equivalent. Review of models and techniques used in forecasting, production control and inventory control. Includes aggregate planning, production scheduling, inventory management, models, etc.
- EIN 6339 Productivity Engineering** 3 cr (3,0)
Basic concepts and tools including measurement, evaluation, planning, and improvement. Latest models and techniques pertinent to both the manufacturing and service sectors are introduced.
- EIN 6357 Advanced Engineering Economic Analysis** 3 cr (3,0)
PR: EGN 3613; STA 3032 or equivalent. Topics include measuring economic worth, economic optimization under constraints. Analysis of economic risk and uncertainty, foundations of utility functions.
- EIN 6392C Manufacturing Systems** 3 cr (2,2)
The integration of new technologies and information processing concepts into a system for controlling the manufacturing enterprise.
- EIN 6417 Precision Engineering** 3 cr (3,0)
PR: ESI 4234 or C.I. Designing for high precision, machine accuracy, error reduction, thermal effects, coordinate measuring machines, and machine calibration with laser interferometry.
- EIN 6330 Quality Control in Automation** 3 cr (3,0)
PR: ESI 4234 or C.I. Quality control applications in industrial automation, implementation of quality control through automated inspection, statistical tolerancing, application of statistics in quality control.
- EIN 6418C Electronics Manufacturing** 3 cr. (3,0)
PR: EIN 4391 or C.I. Electronics fabrication and assembly, FMS and CAD/CAM in electronics, information and control systems, micromachining with lasers, and surface mount technology.
- EIN 6647 Intelligent Simulation** 3 cr (2,2)
The use of intelligent objects in building simulation models to achieve a goal by altering the scenarios during problem solution.
- EIN 6645 Modeling and Simulation of Real-time Processes** 3 cr (3,0)
Mathematical modeling and computer simulation of engineering and scientific systems. Examination of hardware, software and solution methods for real-time systems.
- EIN 6xyz Total Quality Management** 3 cr (3,0)
PR: ESI 6225 or equivalent. Origins and practices of the U.S. TQM movement. TQM as a competitive strategy. Productivity and performance improvement strategies with TQM.
- EIN 6933 Systems Acquisition** 3 cr (3,0)
What the engineer needs to know about the systems acquisition process when dealing with government contracting agencies.
- EIN 6649 Intelligent Simulation Training System Design** 3 cr (2,2)
A systems approach to building intelligent simulation training systems. Emphasis on removing the human instructor from the content training.
- EIN 6603 Readings in Expert Systems/AI in Industrial Engineering** 3 cr (3,0)
PR: EIN 5602C or equivalent. Reading and discussing current topics in expert systems/AI as applied to IE. Current literature in intelligent simulation training systems.
- EIN 6605C Robotics in Industry** 3 cr (3,2)
Robotic systems and their use in industrial operations, on-line and off-line programming.
- EIN 6607C Computer Numerical Control** 3 cr (2,2)
Computer numerical control (NC) systems and languages. Surface and part definition.

- EIN 6608 Surface Design and Manufacture** **3 cr (3,0)**
Techniques for designing surfaces and parts, and methods for describing their manufacture.
- EMA 5108 Surface Science** **3 cr (3,0)**
PR: PHY 3049 and C.I. Methods of chemical and physical analysis of surfaces, with emphasis on ultra-high vacuum spectroscopies utilizing electron, ion and photon probes.
- EMA 5126 Physical Metallurgy** **3 cr (3,0)**
PR: EML 3236 or C.I. Study of strengthening mechanisms and phase transformations in metals and alloys.
- EMA 5140 Introduction to Ceramic Materials** **3 cr (3,0)**
PR: EGN 3363. Uses, structure, physical and chemical properties, and processing of ceramic materials. Discussions will include recent developments for high technology applications.
- EMA 5163 Polymer Science and Engineering** **3 cr (3,0)**
PR: EGN 3363. Molecular structure, physical and chemical properties, preparation and processing of macromolecular materials. Discussions will include recent developments for high technology applications.
- EMA 5304 Scanning Electron Microscopy, Principles and Practice** **3 cr (2,2)**
PR: PHY 3049 and C.I. The principles of operation of electron microscopes, specimen preparation, special techniques with emphasis on scanning microscopy and microprobe analysis.
- EMA 5326 Corrosion and Electrochemical Engineering** **3 cr (3,0)**
PR: EGN 3363. Electrochemical principles and applications to detecting and monitoring corrosion processes. Various forms of corrosion, their causes and control. Application in electric vehicles and electrochemical machining.
- EMA 5626 Mechanical Metallurgy** **3 cr (3,0)**
PR: EML 3234 or C.I. Study of the microscopic mechanical behavior of metals and alloys with emphasis on fracture, fatigue and creep.
- EMA 6136 Diffusion in Solids** **3 cr (3,0)**
PR: EGN 3343 and EGN 3363 or C.I. Fundamental equations and mechanisms of diffusion. Diffusion in metallic, ionic and semiconducting materials with emphasis on measurement techniques.
- EMA 6504 Modern Characterization Techniques for Materials** **3 cr (3,0)**
PR: EMA 5108. Practical approach and demonstrations of materials characterization emphasizing state of the art techniques.
- EMA 6628 Materials Failure Analysis** **3 cr (3,0)**
PR: EMA 5626 or C.I. Comprehensive overview of the general procedures for failure analysis, failure theories, fractography of different failures and modern analytical tools.
- EML 5105 Statistical Thermodynamics** **3 cr (3,0)**
PR: EGN 3343, PHY 3421. Statistical approach to thermodynamic concepts, laws, and methods of analysis. Generalized p-v-T data. Special systems.
- EML 5152 Intermediate Heat Transfer** **3 cr (3,0)**
PR: EML 4142, EML 5713 or C.I. An intermediate level course dealing with heat and mass diffusion, boundary layer problems, and radiation from real bodies. Emphasis on combined modes, numerical methods.
- EML 5224 Acoustics** **3 cr (3,0)**
PR: MAP 3302, EML 4220, PHY 3049. Elements of vibration theory and wave motion; radiation, reflection, absorption, and transmission of acoustic waves; architectural acoustics; control and abatement of environmental noise pollution; transducers.
- EML 5245 Tribology** **3 cr (3,0)**
Principles of fluid film lubrication; bearing design and application; friction and wear of materials.
- EML 5417 Solar Energy Systems** **3 cr (3,0)**
PR: EML 4142. Principles of solar energy thermal processes. Analysis and design of solar collectors and solar heating and cooling systems.
- EML 5451 Energy Conversion** **3 cr (3,0)**
PR: EML 3101 and PHY 3101. Direct methods of energy conversion; particular emphasis on fuel cells, thermoelectrics, thermionics, solar energy, photovoltaics and magnetohydrodynamics.

- EML 5454 Photovoltaics** 3 cr (3,0)
PR: EGN 3375C, EGN 3331c, or C.I. Direct conversion of solar energy into electricity; crystalline and thin-film cell technologies; stand-alone and utility-interactive applications; emphasis on system design, sizing and analysis.
- EML 5455 Energy Conservation** 3 cr (3,0)
PR: EML 4142. Analysis of energy use in economic sectors and design of conservation methodologies to reduce energy use. Heating and cooling loads, passive building designs will be presented.
- EML 5532 Computer-aided Design for Manufacture** 3 cr (3,0)
PR: EGN 3331 and EML 3500 or C.I. Theory and application of computer algorithms for the synthesis, simulation, design and manufacture of mechanical and thermal systems.
- EML 5546 Engineering Design with Composite Materials** 3 cr (3,0)
PR: EAS 4200, or EML 3502 or C.I. Mechanics of structural components of composite materials under static, thermal, vibratory loads. Instability. Lamina and laminate theory, energy methods, failure theories and structural joining methods.
- EML 5609 Environmental Thermodynamics** 3 cr (3,0)
PR: EML 3101 and EML 4142. Thermodynamics of the environment emphasizing analysis and design of thermal systems. Building heating and cooling load calculations and energy conservation technologies analyzed.
- EML 5713 Intermediate Fluid Mechanics** 3 cr (3,0)
PR: EML 4703. Fluid kinematics; conservation equations; Navier-Stokes equations; boundary layer flow; inviscid flow; circulation and vorticity; low Reynolds number flow; turbulence.
- EML 6104 Classical Thermodynamics** 3 cr (3,0)
PR: EML 3101 or C.I. A general postulative approach to classical macroscopic thermodynamics featuring states as fundamental constructs. Conditions of equilibrium, stability criteria, thermodynamic potentials. Maxwell relations and phase transitions.
- EML 6124 Two-Phase Flow** 3 cr (3,0)
PR: EML 4142. Introduction to two-phase flow and boiling heat transfer. General transport equations and models for analyzing two-phase systems. Emphasis placed on liquid-vapor systems.
- EML 6131 Combustion Phenomena** 3 cr (3,0)
PR: EML 4142, EML 3101. Physical and chemical aspects of combustion phenomena. Rate processes, chemical kinetics, structure, propagation, aerodynamics and stability of premixed and diffusion flames.
- EML 6154 Conduction Heat Transfer** 3 cr (3,0)
PR: EML 5152, ECM 6235 or C.I. Classical and numerical techniques applied to the solution of steady and transient conduction problems. Applications to the design of thermal systems.
- EML 6155 Convection Heat Transfer** 3 cr (3,0)
PR: EML 5152, EML 5713 or C.I. Convection heat, mass and momentum transfer in laminar and turbulent flows. Applications to the design of thermal systems.
- EML 6157 Radiation Heat Transfer** 3 cr (3,0)
PR: EML 5152 or C.I. Radiation properties and analysis of radiation heat transfer problems. Applications to the design of thermal systems.
- EML 6223 Advanced Vibrational Systems** 3 cr (3,0)
PR: EML 5271 or C.I. Mechanical systems with multi-degrees-of-freedom. Introduction to non-linear and random vibrations. Concepts of modern dynamic analysis.
- EML 6226 Analytical Dynamics** 3 cr (3,0)
PR: EML 5271. Variational principles and Lagrange equations; systems with constraints; canonical transformations; Hamilton-Jacobi theory.
- EML 6237 Advanced Mechanics of Materials** 3 cr (3,0)
PR: EGN 3331, EML 3500 or C.I. Elements of elasticity, failure theories. Bending and torsion. Thin Plates. energy Principles. Introduction to finite elements. Applications to design.
- EML 6271 Dynamics** 3 cr (3,0)
PR: EGN 3321, EML 4220 or C.I. Dynamics of particles, rigid bodies and distributed mass systems. Hamilton's principle. Lagrange's equations. Numerical methods. Mechanisms.

- EML 6279 Synthesis of Mechanisms** 3 cr (3,0)
PR: EML 5271 or C.I. Advanced synthesis, analysis, and design of planar and spatial mechanisms. Inversion techniques; computer applications; design of robotic manipulators.
- EML 6305C Experimental Mechanics** 3 cr (2,2)
PR: EML 3303, PHY 3421C. Selected topics in strain measurements, photoelasticity, holographic interferometry; laser speckle measurement; acoustic emission, measurement of correlation and coherence functions.
- EML 6306 Advanced Engineering Instrumentation** 3 cr (3,0)
PR: EML 3303 or equivalent. Theoretical and experimental study of principles of operation, analysis and design of mechanical and electromechanical systems.
- EML 6311 System Control** 3 cr (3,0)
PR: EGN 4714 or equivalent. Theoretical, experimental and computer methods involved in the design of control systems. Emphasis on non-linear systems and advanced methods for control system analysis and optimization.
- EML 6402 Turbomachinery** 3 cr (3,0)
PR: EGN 3343 and EGN 3353 or equivalent. Application of the principles of fluid mechanics, thermodynamics and aerodynamics to the design and analysis of pumps, compressors, and turbines.
- EML 6531 Mechanical Behavior of Materials** 3 cr (3,0)
PR: EML 5237 or C.I. Failures of materials in mechanical design. Macroscopic concepts of damage tolerance, life prediction and fracture control. Introduction to plasticity, creep, fretting, shock, instability and wear.
- EML 6533 Mathematical Methods in Mechanical and Aerospace Engineering** 3 cr (3,0)
PR: MAP 3302 or C.I. Heat transfer, fluid mechanics and mechanical systems problems. Solutions by complex analysis, integral equations, and singular perturbation methods.
- EML 6547 Engineering Fracture Mechanics in Design** 3 cr (3,0)
PR: EML 5237 or C.I. General understanding of elementary concepts. Practical application enabling useful prediction of fracture safety and characteristics. Some general knowledge of fracture mechanisms and fracture criteria.
- EML 6710 Advanced Gas Dynamics** 3 cr (3,0)
PR: EML 5713 and ECM 6235 or C.I. Analysis of steady and unsteady subsonic, supersonic, and hypersonic flows. Aerodynamic applications to the design of nozzles, diffusers, and high speed wind tunnels.
- EML 6712 Mechanics of Viscous Flow** 3 cr (3,0)
PR: EML 5713 and ECM 6235 or C.I. Principal concepts and methods for viscous fluid motion. Incompressible and compressible boundary layer analysis for laminar and turbulent flows.
- EML 6725 Computational Fluid Mechanics** 3 cr (3,0)
PR: EML 5713 and ECM 6235 or C.I. plus knowledge of FORTRAN. Computer studies of dynamics of a body moving through a fluid medium; inviscid and viscous flows; introduction to secondary flows and flow instabilities.
- ENV 5013 Environmental Analysis of Transportation Systems** 3 cr (3,0)
PR: EGN 3704, ENV 4121C or C.I. The course deals with the environmental process needed for the successful planning of transportation projects. The analysis of noise, air quality, wetlands, and other environmental areas will be covered in addition to abatement measures.
- ENV 5045L Research Methods in Environmental Engineering** 1 cr (0,2)
PR: STA 3032, ENV 4561 or C.I. Experimental design and modeling of environmental engineering systems using fundamental concepts of computer programming, probability and statistics.
- ENV 5415C Potable Water Treatment** 3 cr (2,3)
PR: EES 4202 and 4111. Engineering application of potable water chemistry involving coagulation, softening, filtration, corrosion, disinfection quality and drinking water.
- ENV 5505 Sludge Management Operations in Environmental Engineering** 3 cr (3,0)
PR: ENV 4561. Theory and design of sludge management operations and processes in environmental engineering, including stabilization dewatering and ultimate disposal.
- ENV 5335 Hazardous Waste Management** 3 cr (3,0)
PR: EGN 3704 or C.I. Engineering planning and analysis associated with the handling, storage, treatment, transportation, and disposal of hazardous wastes.

- ENV 5615 Environmental Impact Assessment** 3 cr (3,0)
PR: C.I. Estimating, predicting, and evaluating the effects of projects, processes, and systems upon the environment, and upon human society.
- ENV 6015 Physical/Chemical Treatment Systems in Environmental Engineering** 3 cr (3,0)
PR: ENV 4561 and EES 4202 or C.I. Theory and design of physical and chemical operations and processes in environmental engineering using latest technologies.
- ENV 6016 Biological Treatment Systems in Environmental Engineering** 3 cr (3,0)
PR: EES 4111 and ENV 4561 or C.I. Theory and design of biological operations and processes in environmental engineering using the latest technologies.
- ENV 6017L Unit Operations & Processes Laboratory** 3 (1,6)
PR: ENV 6015, ENV 6016, STA 3032 or C.I. Laboratory exercises in physical, chemical, and biological processes applicable to design. Experimental design and modeling of environmental engineering systems.
- ENV 6018 Environmental Engineering Process Control** 3 cr (3,0)
PR: EGN 4703, ENV 4561. Environmental systems using feedback and feedforward real-time Laplace or frequency domain dynamics.
- ENV 6055C Fate and Transport of Subsurface Contaminants** 3 cr (3,0)
PR: EES 4202, EES 4111. Principal concepts and modeling of the physical, chemical, and biological transport and transformation processes for subsurface contaminants.
- ENV 6106 Theory and Practice of Atmospheric Dispersion Modeling** 3 cr (3,0)
PR: ENV 4121 or C.I. Atmospheric composition and dynamics. Engineering methods of mathematical modeling, both for point source and mobile source. Current computer models will be used.
- ENV 6126 Design of Air Pollution Controls** 3 cr (3,0)
PR: ENV 4121. Current methods for engineering design and performance analysis of air pollution control equipment to include scrubbers, baghouses, electrostatic precipitators, VOC incinerators, others.
- ENV 6347 Hazardous Waste Incineration** 3 cr (3,0)
Theory and applications of design and operations of hazardous waste incinerators. Includes detailed consideration of air pollution control equipment.
- ENV 6356 Solid Wastes Management** 3 cr (3,0)
PR: ENV 4341 or C.I. Study of the extent and characteristics of the solid waste problem, collection and disposal systems, environmental modeling and selected designs.
- ENV 6519 Aquatic Chemical Processes** 3 cr (3,0)
PR: EES 4202 and EES 4401 or C.I. The applicability of water chemistry and physical chemistry on natural waters and waste-water with emphasis on environmental engineering problems.
- ENV 6558 Industrial Waste Treatment** 3 cr (3,0)
PR: ENV 4561. Theories, methods, unit operations of management, reduction, treatment, disposal of industrial wastes.
- ENV 6565 Water and Wastewater Systems Design** 2 cr (2,0)
PR: ENV 4505 or C.I. Project course on design of water and wastewater systems.
- ENV 6616 Receiving Water Impacts** 3 cr (3,0)
PR: EES 4202 and 4111 or C.I. Study of fate and transport of pollutant loadings into receiving waters, based upon physical, chemical, and biological interactions in natural systems.
- ESI 5170 Microcomputer Practicum** 3 cr (2,3)
PR: Graduate Standing or C.I. Survey of personal computer programming and use in decision support applications in engineering.
- ESI 5236 Reliability Engineering** 3 cr (3,0)
PR: ESI 4234, or equivalent or C.I. Reliability theory and modeling approaches. Topics include: failure data analysis, maintainability, reliability standards (DOD), software reliability, reliability in design, and electronic systems reliability.
- ESI 5316 Operations Research** 3 cr (3,0)
PR: EGN 4634 or C.I. Methods of operations research including formulation for models and derivation of solutions; linear programming, network models queuing theory, simulation and nonlinear optimization techniques.

- ESI 5531 Discrete Systems Simulation** **3 cr (3,0)**
PR: STA 3032 or STA 5156, COP 3215. Methods for performing discrete systems simulation, including network modeling, will be treated.
- ESI 6217 Statistical Aspects of Digital Simulation** **3 cr (3,0)**
PR: STA 5156 or C.I. Statistical issues in digital simulation including input data analysis pseudorandom number generation, experimental design, and simulation output analysis.
- ESI 6224 Quality Management** **3 cr (3,0)**
PR: ESI 4234 or equivalent or C.I. Implementation and management of the quality assurance function. Topics include organization for quality, quality information systems, quality cost, quality circles, and total quality control.
- ESI 6225 Quality Assurance** **3 cr (3,0)**
PR: ESI 4234 or equivalent or C.I. Methods for quality improvement including process capability studies, use of statistical aids, design for quality, product and process control charts, MIL-STD-105D and 414, and Taguchi methods.
- ESI 6336 Queuing Systems** **3 cr (3,0)**
PR: STA 5156. Analysis of queuing systems and waiting line problems using analytical and Monte Carlo methods. Laboratory assignments.
- ESI 6427 Mathematical Programming I** **3 cr (3,0)**
PR: EGN 4634. Theory and applications of linear, non-linear, dynamic and goal programming techniques.
- ESI 6437 Mathematical Programming II** **3 cr (3,0)**
PR: ESI 6427. Continuation of ESI 6427.
- ESI 6529 Advanced Systems Simulation** **3 cr (3,0)**
PR: ESI 5531. Combined networks discrete and continuous simulation, applications, statistics of analysis and comparison of simulation language.
- ESI 6532 Object-oriented Simulation** **3 cr (2,2)**
Object-oriented modeling and development techniques for building large process-based discrete event simulation models. Concurrency in discrete event simulation. Object-oriented simulation environment.
- MET 5710 Meteorology for Engineers** **3 cr (3,0)**
PR: MAC 3313. Studies of the atmospheric processes from physical thermodynamics and synoptic viewpoints.
- STA 5156 Probability and Statistics for Engineers** **3 cr (3,0)**
PR: STA 3032 or equivalent. Theory and applications of discrete and continuous random variables, hypothesis tests, confidence intervals, regression analysis, and correlation.
- TTE 5205 Traffic Engineering** **3 cr (3,0)**
PR: TTE 4004.
- TTE 5206 Highway Capacity and Traffic Flow Analysis** **3 cr (3,0)**
PR: TTE 4004. Highway capacity for all functional classes of highways. Traffic signalization; including traffic studies, warrants, cycle length, timing, phasing and coordination.
- TTE 5805 Geometric Designs of Transportation Systems** **3 cr (3,0)**
PR: TTE 4004. Study of geometric and construction design elements in the engineering of transportation systems.
- TTE 5835 Pavement Design** **3 cr (3,0)**
PR: ECI 4305. Pavement types, wheel loads, stresses in pavement components, design factors such as traffic configurations, environmental, economic, drainage, and materials.
- TTE 6526 Planning and Design of Airports** **3 cr (3,0)**
PR: C.I. Background of aviation and airport development, aircraft characteristics. Planning and design of airport components. Heliport and STOL ports and pavement and drainage design.
- TTE 6625 Mass Transportation Systems** **3 cr (3,0)**
PR: C.I. Planning, design, construction, operation, and administration of mass transportation systems.
- TTE 6971 Treatise (Thesis or Research Report)** **3-6 cr**



COLLEGE OF HEALTH AND PUBLIC AFFAIRS

The College of Health and Public Affairs offers four graduate programs: the Master of Arts in Communicative Disorders, the Master of Science in Health Sciences, the Master of Science in Molecular Biology and Microbiology and the Master of Public Administration. The mission of the College of Health and Public Affairs is to provide undergraduate and graduate education, to foster, through research, the development and transmission of knowledge, and to offer continuing education for community professionals and citizens.

COLLEGE ADMINISTRATION

<i>B. R. McCarthy</i>	Dean
<i>W. C. Lawther</i>	Associate Dean and Associate Professor
<i>M. J. Edwards</i>	Interim Associate Dean and Associate Professor

Faculty

Communicative Disorders

<i>D. L. Hedrick, Ph.D.</i>	Professor
<i>D. L. Ratusnik, Ph.D.</i>	Professor
<i>D. B. Ingram, Ph.D.</i>	Associate Professor
<i>T. A. Mullin, Ph.D.</i>	Associate Professor
<i>W. D. Tropf, Ph.D.</i>	Interim Chair and Associate Professor
<i>H. A. Utt, Ph.D.</i>	Assistant Professor

Health Sciences

<i>J. Acierno, M.D.</i>	Professor
<i>J. F. Bergner, Ph.D.</i>	Professor
<i>D. J. Crittenden, Ph.D.</i>	Associate Professor
<i>J. S. Lytle, M.P.H.</i>	Associate Professor
<i>T. S. Mendenhall, Ph.D.</i>	Associate Professor
<i>D. F. Hitchcock, M.S.</i>	Assistant Professor

Molecular Biology and Microbiology

<i>R. N. Gennaro, Ph.D.</i>	Chair and Associate Professor
<i>O. M. Berringer, Ph.D.</i>	Professor
<i>M. J. Sweeney, Ph.D.</i>	Professor
<i>R. S. White, Ph.D.</i>	Professor
<i>R. J. Wodzinski, Ph.D.</i>	Professor
<i>J. F. Charba, Ph.D.</i>	Associate Professor
<i>R. N. Gennaro, Ph.D.</i>	Associate Professor
<i>R. J. Laird, Ph.D.</i>	Associate Professor
<i>D. W. Washington, Ph.D.</i>	Associate Professor

Public Administration

<i>P. W. Colby, Ph.D.</i>	Interim Chair and Professor
<i>R. A. Shapek, Ph.D.</i>	Professor
<i>W. C. Lawther, Ph.D.</i>	Associate Professor
<i>J. D. Jurie, D.P.A.</i>	Assistant Professor
<i>S. L. Riley, M.P.A.</i>	Visiting Assistant Professor
<i>E. Rosell, D.P.A.</i>	Assistant Professor
<i>M. P. Aristigueta, M.P.A.</i>	Instructor

PROGRAMS IN COMMUNICATIVE DISORDERS

Professional education is offered in Communicative Disorders leading to the Master of Arts degree in Speech-Language Pathology. The program requires the equivalent of two years full-time attendance to complete and is designed to meet the certification requirements of the American Speech-Language-Hearing Association. The program is accredited by the Educational Standards Board of the American Speech-Language-Hearing Association.

The faculty is keenly aware of the need for combining clinical skills with theoretical foundations. Supervised student practica are offered in the Communicative Disorders Clinic on campus as well as in external settings. Selected outstanding professionals in Central Florida (physicians, speech/language pathologists) make up the clinical faculty which supplements the clinical expertise of the regular faculty.

All students will enroll in SPA 6505 or 6506, Clinical Practica, or equivalents, each semester in attendance, with the exception of the semester they are enrolled in SPA 5553L, Differential Diagnosis in Speech and Language Laboratory, and the semester they are completing the thesis/non-thesis option. Students must complete 300 clock hours of practicum experience as outlined by the American Speech-Language-Hearing Association before graduation.

Master of Arts in Communicative Disorders Degree Requirements

PREREQUISITES

B.A. in Speech and Hearing (Communicative Disorders) or special prerequisite courses to be arranged with the program coordinator.

All students must take STA 4163, Statistical Methods II, or equivalent, and achieve a grade of "C" or better prior to, or during, their graduate program. This course is a prerequisite to SPA 5805, Research in Communicative disorders.

REQUIRED COURSES

39 Semester Hours

SPA	5307	Differential Diagnosis in Audiology	3 hours
SPA	5554	Therapeutic Communication	3 hours
SPA	5600	Administration and Management of Communicative Disorders	3 hours
SPA	5805	Research in Communicative Disorders	3 hours
SPA	6410	Language Problems in Adults	4 hours
SPA	5225	Fluency disorders	3 hours
SPA	5225L	Fluence Disorders Laboratory	1 hour
SPA	5553	Differential Diagnosis in Speech and Language	3 hours
SPA	5553L	Differential Diagnosis in Speech and Language Laboratory	1 hour
SPA	6132	Measurements in Speech Science	3 hours
SPA	6204	Advanced Studies in Communicative Disorders: Articulation	3 hours
SPA	6204L	Articulation Laboratory	1 hour
SPA	6211	Voice Disorders	3 hours
SPA	6211L	Voice Disorders Laboratory	1 hour
SPA	6403	Advanced Studies in Communicative Disorders: Language	4 hours

PRACTICUM credit toward degree

6 Semester Hours

All students must register for three hours each semester while in attendance, with exceptions as noted.

THESIS/NON-THESIS OPTIONS

Each student will complete a thesis or non-thesis option.

Thesis Option

6 Semester Hours

Students selecting the thesis option will complete a thesis in the area of speech/language pathology for six semester hours of credit. An advisory committee of three faculty members,

chaired by a departmental faculty member, will be selected to guide the student through the thesis requirements. An oral defense of the thesis is required.

Non-thesis Option

7 Semester HOURS

A student selecting the Clinical Internship option must complete 6 semester hours of Internship in Speech-Language Pathology. In addition, a student in the Clinical Internship option must register for one hour of Directed Research.

EXAMINATIONS

A final comprehensive examination on course work is required. This examination must be passed before a student can be considered a degree candidate.

Total Minimum Semester Hours Required:

Speech-Language Pathology

51

HEALTH SCIENCES

Thomas S. MendenhallGraduate Program Coordinator
Office: HPB 220, Phone (407) 823-2972

Admission

Admission to graduate status in the Master of Science in Health Sciences (M.S.) degree program is based on the following:

- a. A baccalaureate degree from a regionally accredited college or university and a grade point average (GPA) of 3.0 (4.0 = A) for the last 60 semester hours of credit earned for the baccalaureate degree, and a Graduate Record Examination (GRE) score of at least 840; or a grade point average (GPA) of at least 2.75 (4.0 = A) for the last 60 semester hours of credit earned for the baccalaureate degree and a GRE score of at least 1000. The GRE score cannot be over 7 years old.

or

A graduate degree from a regionally accredited institution.

A GRE test is required of all graduate students whether accepted on the GPA, GRE or previous degree.

- b. Submission of three letters of recommendation from individuals capable of assessing the applicant's ability to undertake graduate work.
- c. Completion of undergraduate course work comprising a knowledge of the United States health care system, basic statistics, and human disease.

In accordance with SUS and UCF policy, a limited number of students who do not meet all the requirements for regular admission to the Health Sciences Program but who show promise of success may be admitted in a provisional status.

Admission into graduate status in the program will be determined three times a year (about four weeks prior to the beginning of each semester). Students must have required admission materials on file with the Health Sciences Program in order to be considered for graduate status.

Programs in Health Sciences

The Master of Science degree in Health Sciences is divided into three sections. The first section is a core of courses to provide an in-depth foundation in scientific investigation, the fundamentals of human pathophysiology, and a broad understanding of the health care systems in the United States in comparison to systems in other nations.

The second section involves courses in the specialization areas of management, education, or advanced clinical training. The advanced clinical training areas include cardiopulmonary sciences and medical laboratory sciences. Other advanced clinical training areas will be added as resources permit.

The third section involves courses from other colleges that are cognate to the student's discipline. These courses, in keeping with particular needs, interests, and backgrounds, will be primarily in biochemistry, biology, computer sciences, management or education. Practica will be offered which will enable the student to apply the knowledge gained through the

course work to teaching in a health discipline, management of a health educational program, management of a clinical department, or advanced clinical research.

Each student will complete either a thesis or research report after completing the course work.

Degree Requirements

All students must complete the core courses. In addition students, with the assistance of an advisor, will complete a program of study consistent with career objectives.

Comprehensive Examination

An oral or written comprehensive examination is required of all students in the Health Sciences Program. The comprehensive examination will be taken within the first four weeks of the term in which the student expects to graduate. Examinations will receive an evaluation of "pass," "conditional pass," or "fail." If a student receives a "conditional pass" on the comprehensive examination, an oral or written re-examination will have to be taken and passed. A failed examination will receive no retest. All students must successfully pass the comprehensive examination in order to graduate.

REQUIRED CORE			12 Semester Hours
HSC	6636	Issues and Trends in the Health Professions	3 hours
HSC	6911	Scientific Inquiry in the Health Professions	3 hours
PHC	6000	Epidemiology	3 hours
STA	5026	Statistical Analysis	3 hours

AREA OF EMPHASIS (See requirements for each) 21-26 Semester Hours

RESEARCH REPORT 3 Semester Hours
or

THESIS 6 Semester Hours
If the thesis option is chosen, 3 hours less are required in Group B electives.

AREAS OF EMPHASIS

Students must select one of the following three options:

1. Health Services Administration Option 24 Semester Hours
Students must select a minimum of 15 hours from Group A and 9 hours from Group B.

Group A: Health Care Management Courses			15 Semester Hours
HSA	5198	Information Systems and Computer Applications in Medicine	3 hours
HSA	6107	Health Care Organization and Management I	3 hours
HSA	6108	Health Care Organization and Management II	3 hours
HSA	6815	Practicum in Health Care Management	3 hours
PHC	6160	Health Care Finance	3 hours
PHC	6420	Case Studies in Health Law	3 hours
Group B: Electives			9 Semester Hours
ACG	5005	Financial Accounting Concepts	3 hours
ECO	5005	Economic Concepts	3 hours
FIN	5405	Financial Concepts	3 hours
MAN	6206	Organizational Behavior and Management	3 hours
MAR	5055	Marketing Concepts	3 hours
MAR	6606	Marketing Research Methods	3 hours
PAD	6335	Strategic Planning and Management	3 hours
PAD	6417	Human Resource Management	3 hours
PAD	5700	Analytic Techniques for Public Administration I	4 hours
PAD	6701	Analytic Techniques for Public Administration II	4 hours
RMI	6008	Risk Management	3 hours
Elective to be selected with advisor's consent			3 hours

Total Minimum Semester Hours Required: 39

2. Education Option

24 Semester Hours

Students must select a minimum of 12 hours from Group A and 12 hours from Group B.

Group A: Health Care Education Courses			12 Semester Hours
HSC	6247	Health Science Education	3 hours
HSC	6306	Health Science Program Development and Operation	3 hours
HSC	6245	Community Health Education	3 hours
HSC	6815	Practicum in Health Science Education	3 hours
Group B: Electives			12 Semester Hours
EDF	6155	Lifespan Human Development and Learning	3 hours
EDF	6259	Strategies of Classroom Management	3 hours
EDF	6401	Statistics for Educational Data	3 hours
EDF	6432	Measurement and Evaluation in Education	3 hours
EME	5208	Media and Methods in Teaching	3 hours
ESE	6235	Curriculum Design	3 hours
EVT	5315	Applied Clinical Teaching Techniques in Vocational Education	3 hours
EVT	5316	Clinical Coordination for the Health Occupations Teacher	3 hours
HSA	5198	Information Systems and Computer Applications in Medicine	3 hours
HSA	6107	Health Care Organization and Management I	3 hours
PHC	6420	Case Studies in Health Law	3 hours
Total Minimum Semester Hours Required:			39

3. Advanced Clinical Skills and Research Option

This option offers two areas of specialization: cardiopulmonary sciences and medical laboratory sciences.

a. Specialization in Cardiopulmonary Sciences

25 Semester Hours

This specialization is offered by the Cardiopulmonary Science Department and is designed to provide the professional with a sound scientific background in the cardiopulmonary sciences. Persons interested in advanced clinical practice, rehabilitation programs, exercise physiology, pulmonary function testing and basic research may find this specialization useful.

Group A: Cardiopulmonary Sciences Courses			13 Semester Hours
HSA	5198	Information Systems and Computer Applications in Medicine	3 hours
RET	5937	Special Topics: Advanced Study in Cardiopulmonary Physiology with Lab	4 hours
RET	5937	Special Topics: Research Methods in Medicine	3 hours
RET	6700	Cardiac Rehabilitation and Prevention	3 hours
Group B: Electives			12 Semester Hours
PCB	6746	Organismal Physiology	4 hours
RET	5937	Special Topics: Exercise Physiology	3 hours
RET	5937	Special Topics: Research Seminar	2 hours
Elective to be selected with advisor's consent			3 hours
Total Minimum Semester Hours Required:			40

b. Specialization in Medical Laboratory Sciences

24-26 Semester Hours

Advanced professional education in Medical Laboratory Sciences is designed for the credentialed medical technologist, generalist, or specialist. Emphasis in Immunohematology is offered in cooperation with the Central Florida Blood Bank. Students desiring advanced course work in one of the other clinical laboratory specialties may select, with the approval of the faculty advisor, courses from the lists offered in Groups A and B in order to enhance and broaden their career objectives. Following satisfactory completion of course work, each student must pass a comprehensive examination and complete a thesis or research

project. Prerequisite courses in immunology and statistics are required for admission.

Students in the Medical Laboratory Sciences Specialization may select, with the consent of the advisor, HSA 5198, Information Systems and Computer Applications in Medicine (3 hours) instead of PHC 6000, Epidemiology (3 hours) in the core courses.

Students must select a minimum of 12 semester hours from Group A and 12 hours from Group B, except for students in the Immunohematology emphasis who must select a minimum of 14 hours from Group B.

GROUP A: Medical Laboratory Sciences Courses			12 Semester Hours
MLS	6890	Advanced Clinical Practicum I	3 hours
MLS	6891	Advanced Clinical Practicum II	3 hours
MLS	6892	Advanced Clinical Practicum III	3 hours
MLS	6893	Advanced Clinical Practicum IV	3 hours
MLS	6338	Advanced Hemostasis	3 hours
MLS	5509	Clinical Immunology	3 hours
GROUP B: Electives			12-14 Semester Hours
HSC	6247	Health Science Education	3 hours
HSC	6306	Health Science Program Development and Operation	3 hours
EDF	6432	Measurement and Evaluation in Education	3 hours
EME	5202	Media and Methods in Teaching	3 hours
ESE	6218	Curriculum Writing	3 hours
EVT	5315	Applied Clinical Teaching Techniques	3 hours
EVT	5685	Competency Based Vocational Education	3 hours
ACG	5005	Financial Accounting	3 hours
FIN	5405	Financial Concepts	3 hours
MAN	5051	Management Concepts	2 hours
MAR	5055	Marketing Concepts	3 hours
MCB	5505C	Virology	3 hours
PCB	6235C	Immunochemistry	3 hours
APB	5581	Applied Microbiology	3 hours

Total Minimum Semester Hours Required:	39
With emphasis in Immunohematology:	41

MOLECULAR BIOLOGY AND MICROBIOLOGY

<i>R. N. Gennaro, Ph.D.</i> Associate Professor, Chair and Graduate Program Coordinator
<i>O. M. Berringer, Ph.D.</i> Professor
<i>M. J. Sweeney, Ph.D.</i> Professor
<i>R. S. White, Ph.D.</i> Professor
<i>R. J. Wodzinski, Ph.D.</i> Professor
<i>J. F. Charba, Ph.D.</i> Associate Professor
<i>R. J. Laird, Ph.D.</i> Associate Professor
<i>D. W. Washington, Ph.D.</i> Associate Professor

Admission

The minimum requirements for consideration for graduate status in the M.S. Program in Molecular Biology and Microbiology are a grade point average (GPA) of at least 3.0 for the last 60 semester hours of undergraduate study or a score of at least 1000 on the combined quantitative-verbal sections of the Graduate Record Exam (GRE). Additionally, the department requires three letters of recommendation plus a written statement of past experience and research, area in interest, and immediate and long-range goals. Personal interviews are helpful but not required.

The department requires international students and students whose native language is not English to have a minimum TOEFL score of 550.

Applicants who fail to meet either the minimum program GPA or GRE requirement may occasionally be accepted if there is other convincing evidence of potential for high achievement and success. Applicants failing to satisfy minimum program criteria should

submit a GRE Subject (Advanced) Biology Test score at or above the 50th percentile. In no case will GRE scores (verbal, quantitative, or advanced) older than five years be accepted.

Applicants need not have an undergraduate degree in molecular biology or microbiology but are expected to have the equivalent of 16 semester hours credit in biological sciences including a course in general microbiology, plus one year of organic chemistry, one year of physics, basic university mathematics and statistics, *and laboratory skills equivalent to the minimum required of our own undergraduates*. Minor deficiencies may be remedied after acceptance by enrollment at the first opportunity in an appropriate course.

Examinations

A comprehensive examination is required of all students in the M.S. program. The comprehensive exam must be taken no later than the fourth week of that semester after the one in which the student completes all course work in the program of study. If a student fails the comprehensive examination, a minimum of four weeks must elapse before re-examination. The comprehensive exam may be taken a maximum of two times. In addition, an oral thesis defense is required. A minimum of four weeks must elapse between the comprehensive and thesis defense examinations.

Master of Science Degree Requirements

The course and credit requirements will consist of a minimum of 30 semester hours of credit, including six credits of Thesis, two credits of Graduate Seminar, and such other courses as specified by the student's graduate committee in the Approved Program of Study.

MOLECULAR BIOLOGY AND MICROBIOLOGY

APB	5236	Applied Microbiology	3 cr (3,0)
MCB	6407C	Laboratory Methods for Molecular Biology	5 cr (3,4)
MCB	5205	Infectious Processes	3 cr (3,0)
MCB	5505C	Virology	3 cr (2,3)
MCB	6417C	Microbial Metabolism	3 cr (3,1)
PCB	5235	Immunopathology	3 cr (3,0)
PCB	5235L	Immunopathology Laboratory	2 cr (0,4)
PCB	5806	Endocrinology	3 cr (3,0)
PCB	6746C	Organismal Physiology	4 cr (3,3)
ZOO	5745L	Essentials of Neuroanatomy	4 cr (3,2)
MCB	6971	Thesis	1-6 cr

SUMMARY OF M.S. DEGREE REQUIREMENTS

ADMISSION

1. 3.0 G.P.A. last 60 semester hours or 1000 on GRE (quant. + verbal).
2. Three letters of recommendation.
3. TOEFL of 550.
4. 16 semester hours in Biological sciences, including one course in general microbiology, plus one year of organic chemistry, one year of physics, basic university math and statistics, and lab skills equivalent to the minimum of our undergraduate.

EXAMINATION

1. Comprehensive covering all course work in program of study.
2. Final thesis defense.

DEGREE REQUIREMENTS

Minimum of 30 semester hours, including six (6) semester hours of Thesis, and two (2) Semester hours of Graduate Seminars (1/2 6000 level ect.).

PUBLIC ADMINISTRATION

Peter W. Colby Graduate Program Coordinator
Office: PH 102, Phone (407) 823-5365

Admission

The Graduate Record Examination (GRE) is required of all graduate students. Minimum requirements for regular admission are a grade point average (GPA) of 3.0 for the last 60 semester hours of undergraduate study *or* a total score of 1000 or higher on the verbal-quantitative sections of the GRE *or* a previous graduate degree. A limited number of students who do not meet these requirements but who do have at least a 2.5 GPA *and* an 800 GRE score may be admitted on a provisional basis. Individuals whose native language is other than English are required to have a minimum TOEFL score of 550.

Program in Public Administration

The Department of Public Administration's Master of Public Administration (M.P.A.) degree program provides opportunities for students to prepare for employment or advance their careers as public administrators. Our intention is to produce graduates equipped with the public management skills and analytic techniques needed for successful careers in government, non-profit, and closely-related business fields.

Master of Public Administration Degree Requirements

The M.P.A. programs consists of 35-41 hours. Each student completes a core of seven courses (23 hours) and a cognate of three elective courses (9 hours) selected in consultation with the advisor. A student will then enroll in the Graduate Research Report (3 hours) or two additional elective courses (6 hours) within the Department of Public Administration. Finally, those students without practical administrative experience in the public sector must complete an internship (3 hours). A written Comprehensive Exam on the seven core courses is required of all students.

MINIMUM CORE REQUIREMENTS

23 Semester Hours

PAD	6053	Principles of Public Administration	3 hours
PAD	6700	Analytic Techniques for Public Administrators I	4 hours
PAD	6701	Analytic Techniques for Public Administrators II	4 hours
PAD	6037	Public Organization Management	3 hours
PAD	6227	Public Budgeting	3 hours
PAD	6417	Human Resource Management	3 hours
PAD	6335	Strategic Planning & Management	3 hours

SPECIAL SKILL OR COGNATE AREA

9 Semester Hours

A minimum of three courses which concentrate on a specific skill area germane to the practice of Public Administration may be taken within the Public Administration Department or from other departments.

RESEARCH REPORT

3 Hours

Three semester hours of credit may be earned by completing an independent investigatory research project which results in a report acceptable to the department's graduate committee. This option is available only by permission of M.P.A. Coordinator.

COMPREHENSIVE EXAMINATION

A comprehensive written examination covering the required core courses will be administered upon completion of the 23-hour core component.

INTERNSHIP

3 Hours

The internship, required for students without experience in a public sector administrative position, will provide the student with the opportunity to apply theory and analytic techniques to a real world situation. The student will be required to submit a summary and critique paper on the experience to the Master of Public Administration Coordinator at the end of the assignment.

Total Minimum Semester Hours Required:	
Research Report Option Without Internship	35
Two-course Option Without Internship	38
Research Report Option With Internship	38
Two-course Option With Internship	41

College of Health and Public Affairs

APB 5236 Applied Microbiology **3 cr (3,0)**

PR: MCB 3013C or C.I. Biochemistry of industrial processes including: economics, screening, scale up, quality control and applied genetics.

HSA 5198 Information Systems and Computer Applications in Medicine **3 cr (3,0)**

PR: C.I. Overview of health informations systems with an emphasis on computer applications. Discussion of software and hardware requirements.

HSA 6107 Health Care Organization and Management I **3 cr (3,0)**

Study of health care organizations, including modern management, organizational structure, systems control, human performances, planning, and leadership.

HSA 6108 Health Care Organization and Management II **3 cr (3,0)**

PR: HSA 6107, HSA 5148, HSC 6911. Emphasis on planning, development, marketing approaches, and problem solving using computer methods.

HSA 6815 Practicum in Health Care Management **2-6 cr (0,20)**

PR: Graduate status or C.I. Supervised practicum in health care institution management.

HSC 6245 Community Health Education **3 cr (3,0)**

Development and evaluation of community health education programs within voluntary health organizations. HMOs, hospitals, and academic institutions.

HSC 6247 Health Science Curriculum Development **3 cr (3,0)**

PR: Graduate status or C.I. Developing an instructional plan for Health Science curriculum including goal and task analysis, performance objectives, varied learning experiences and student evaluation.

HSC 6306 Organization and Management of Health Science Programs **3 cr (3,0)**

PR: Graduate status or C.I. Management of professional health education programs in various institutional settings: university, community college, academic medical centers. Includes program planning, development, and evaluation.

HSC 6555 Principles and Applications of Medicine **3 cr (3,0)**

PR: HSC 4550 or comparable course. The study of medical principles and conditions and their applications to health management and health education settings.

HSC 6556 Current Concepts in Pathophysiology Mechanisms **3 cr (3,0)**

PR: HSC 4550 or equivalent, Human Anatomy and Physiology or C.I. A study of pathophysiologic mechanisms in causation and evolution of various disease states with special emphasis on recent work.

HSC 6559 Prevention of Cardiovascular Disease **3 cr (3,0)**

Current methods of prevention and management of major cardiovascular disturbances. Diagnostic measures, intervention techniques for prevention, and rehabilitation and management methods.

HSC 6568 Issues in Geriatric Health Care **3 cr (3,0)**

Identification of the health care needs of the elderly and the services required to meet them. Analysis of the current issues, problems, and trends in geriatric health.

HSC 6575 Principles of Preventive Medicine **3 cr (3,0)**

Total concept of health care including methods of screening, diagnosis, treatment, rehabilitation, and promotion of health in diverse populations.

HSC 6636 Issues and Trends in the Health Professions **3 cr (3,0)**

Exploration of current status, issues, problems, and future trends in the practice and education of health professions.

HSC 6815 Practicum in Health Science Education **2-6 cr (0,20)**

PR: Graduate status or C.I. Supervised practicum in academic, clinical, or community instructional program.

HSC 6909 Research Report	3 cr
HSC 6911 Scientific Inquiry in the Health Professions	3 cr (3,0)
PR: STA 2014 or comparable course. The course will cover research design and evaluation, theory building, and biostatistics.	
HSC 6971 Thesis	1-6 cr
HUN 5937 Nutrition and Exercise Physiology	3 cr (3,0)
This course correlates human nutrition with exercise physiology. Nutritional concepts are related to human performance and fitness.	
LIN 5705 Psycholinguistics	3 cr (3,0)
PR: Graduate status or C.I. Foundations of language in affective consciousness and the human nervous system. Pragmatic analysis of word meaning and its precise scientific measurement. Implications for communicative disorders.	
MCB 6407C Laboratory Methods for Molecular Biology	5 cr (3,4)
PR: PCB 3023 or MCB 4404. Experimental techniques and design in laboratory biological research.	
MCB 5205 Infectious Processes	3 cr (3,0)
PR: MCB 3013C or C.I. Discussion of current theories of the infectious process and the response of host cells and tissue to infection.	
MCB 5505C Virology	3 cr (2,3)
PR: MCB 3013C and BCH 4054. Nature of viruses and Rickettsiae, including their structure, propagation, isolation and identification.	
MCB 6417C Microbial Metabolism	3 cr (3,1)
PR: C.I. Relationship between microbial metabolism and principal cellular activities, emphasizing transport, respiration, differentiation and synthesis.	
MCB 6971 Thesis	1-6 cr
MLS 5509 Clinical Immunology	3 cr (3,0)
PR: PCB 3233, MLS 4511, or C.I. Advanced theory and application of immunologic diagnostic testing stressing the utilization of monoclonal technology.	
MLS 6338 Advanced Hemostasis	3 cr (3,0)
PR: MLS 4334C or C.I. Examination of current theories and practice and the relationship to pathophysiologic processes in hemostasis.	
MLS 6890 Advanced Clinical Practicum I	3 cr (2,15)
PR: C.I. Advanced clinical experience related to current practices and trends in one of the following areas of clinical laboratory technology: immunohematology; hematology; clinical chemistry; immunopathology; clinical microbiology; electron microscopy or toxicology.	
MLS 6891 Advanced Clinical Practicum II	3 cr (2,15)
PR: C.I. Advanced study in one of the clinical laboratory areas listed in MLS 6890.	
MLS 6892 Advanced Clinical Practicum III	3 cr (2,15)
PR: C.I. Advanced study in one of the clinical laboratory areas listed in MLS 6890.	
MLS 6893 Advanced Clinical Practicum IV	3 cr (2,15)
PR: C.I. Advanced study in one of the clinical laboratory areas listed in MLS 6890.	
MRE 5217 System Analysis and Design	3 cr (3,0)
Concepts of systems analysis, planning, and design; criteria for assessing information needs; computer system selection; project management allocation and control.	
MRE 5218 Management of Health Information Systems	3 cr (3,0)
PR: MAN 5830. Administration of computer-based information systems; security; policy formulation; health data in decision-making, interpretation of health data.	
MRE 5219 Application of Computer Packages for Data Analysis	3 cr (3,0)
PR: MRE 5217. Application of packaged statistical programs in analysis of data from health sciences. Emphasis on use and interpretation of computer output.	

- MRE 5858 Research Methods** 3 cr (3,0)
PR: HSC 6911, graduate status or C.I. Research topic design using health information; research methodologies using statistical techniques; research designs as they relate to health care organizations.
- MRE 6859 Research Seminar** 3 cr (3,0)
PR: Prior permission of academic advisor. Identify research topics; proposal topics; proposal preparation; literature search.
- PAD 5041 Ethics and Values in Public Administration** 3 cr (3,0)
Issues of ethics in the public sector—the basis for public concern, past practice, present patterns of response; individual/social aspects of ethical behavior.
- PAD 5336 Introduction to Urban Planning** 3 cr (3,0)
PR: C.I. Issues of urbanization, regional development, land use and comprehensive planning, environmental planning, and social planning.
- PAD 5337 Urban Design** 3 cr (3,0)
PR: C.I. Planning techniques such as planned unit developments, capital improvements planning, and growth management, and planning methods including needs assessment and graphic design.
- PAD 5338 Land Use and Planning Law** 3 cr (3,0)
Review of national and local aspects of the legal underpinnings of urban planning aspects such as zoning, growth management and environmental regulation.
- PAD 5424 Labor Relations in the Public Sector** 3 cr (3,0)
Current trends and developments in employment relations in the public sector, especially employee organization, negotiations, and the collective bargaining process.
- PAD 5425 Dispute Resolution in the Public Sector** 3 cr (3,0)
An examination of the skills needed to resolve disputes in the public sector through facilitation, mediation, and other alternative methods.
- PAD 5806 Local Government Operations** 3 cr (3,0)
Operational functions of municipal and county governments and the role of the chief executive officer.
- PAD 5807 Administrative Practice in the Public Sector** 3 cr (3,0)
Application of various theoretical concepts to the real world of public administration. Policy formulation and execution is examined through the case study model.
- PAD 6037 Public Organization Management** 3 cr (3,0)
Structure, functioning, performance of public organizations, and behavior of individuals and groups, application for public management.
- PAD 6053 Principles of Public Administration** 3 cr (3,0)
Graduate level survey course directed toward basic concepts and theoretical approaches in the literature.
- PAD 6227 Public Budgeting** 3 cr (3,0)
Budgets as planning programming documents, stressing the relationships of policy and budgetary decisions, problems in grantsmanship and revenue decision making, program budgeting, PPBS and incrementalism.
- PAD 6307 Policy Implementation** 3 cr (3,0)
Program analysis and organization structure as policy tools, examining the implementation of differential policy and the administrator as policy maker and change agent.
- PAD 6327 Public Program Evaluation Techniques** 3 cr (3,0)
Techniques and skills utilized in the evaluation of public programs.
- PAD 6335 Strategic Planning and Management** 3 cr (3,0)
PR: C.I. An examination and analysis of planning, goal setting and policy development, and strategic management in public sector organizations.
- PAD 6417 Human Resource Management** 3 cr (3,0)
Administrator as manager and motivator of public employees with particular emphasis on organizational behavior and contemporary public service legislation.
- PAD 6700 Analytic Techniques for Public Administration I** 4 cr (3,1)
Statistical methodology and use of computers as a tool for decision making in the public sector.

- PAD 6701 Analytic Techniques for Public Administration II** 4 cr (3,1)
PR: Completion of PAD 6700. Applied analytical tools for administrators in the public sector. Practical use of computers in policy and decision making.
- PAD 6716 MIS for Public Managers** 3 cr (3,0)
PR: C.I. Use of systems concept and computers in contemporary public sector management information systems.
- PAD 6908 Directed Independent Studies** Variable Credit 1-7
- PAD 6918 Directed Research** Variable Credit 1-7
- PAD 6934 Special Issues in Public Administration** 3 cr (3,0)
Substantive and theoretical issues confronting the broad spectrum of contemporary public administration. May be repeated for credit.
- PAD 6946 Internship** 3 cr (3,0)
PR: C.I.
- PCB 5235 Immunopathology** 3 cr (3,0)
PR: 3233. In-depth overview of diseases due to deficiencies or over-reactivity of the immune system.
- PCB 5235L Immunopathology Laboratory** 2 cr (0,4)
PR: PCB 5235. Use of modern immunological diagnostic laboratory procedures related to the immune system.
- PCB 5806 Endocrinology** 3 cr (3,0)
PR: PCB 4723 and BCH 4053 or C.I. Mechanisms of action of hormones; interrelationships between the nervous and endocrine system.
- PCB 6746C Organismal Physiology** 4 cr (3,3)
PR: PCB 3023 or C.I. Modern experimental methods of detailed study of specific phases of the physiology of higher vertebrates.
- PET 5355 Exercise Physiology and Health** 3 cr (3,0)
In-depth study of adaptations of cardiovascular and respiratory systems during varying degrees of exercise.
- PHC 6000 Epidemiology** 3 cr (3,0)
PR: HSC 6911 or equivalent. A study of the distribution and determination of diseases and injuries in human populations.
- PHC 6146 Health Planning and Policy** 3 cr (3,0)
Review of the determinants of the revolution of the health care system in the U.S.; analysis of public health, preventive medicine, and therapeutic medicine in terms of quality, access, and cost; methodologies and issues in comprehensive health planning; and trends in health policy development.
- PHC 6160 Health Care Finance** 3 cr (3,0)
The identification of resources available to health care institutions, allocation of resources, and control of resource expenditures.
- PHC 6300 Environmental Health** 3 cr (3,0)
Recognition and evaluation of control problems arising from environmental contamination, which includes safe water supply, waste disposal, and food resources.
- PHC 6411 Health and Society** 3 cr (3,0)
Understanding health and illness as defined by patients, providers, and other persons in the social system.
- PHC 6420 Case Studies in Health Law** 3 cr (3,0)
Health law including patient care, liability, malpractice, workmen's compensation, and legal responsibilities of health personnel.
- RET 5910 Research Methods in Cardiopulmonary Physiology** 3 cr (3,0)
Introduction to methods used in scientific and medical research in cardiopulmonary physiology. Literature review, experimentation, and analysis of data.
- RET 6700 Cardiac Rehabilitation** 3 cr (3,0)
PR: HSC 6566. Lecture course emphasizing the principles underlying the formulation and implementation of a comprehensive cardiac rehabilitation and prevention program.

- SPA 5005 Survey of Communicative Disorders** 3 cr (3,0)
PR: C.I. A survey of speech, language, and hearing disorders for habilitative personnel and other interested professionals.
- SPA 5120 Physiological Acoustics** 4 cr (4,3)
PR: SPA 4032, Graduate status or C.I. Lectures, readings and experiments pertaining to the subjective reception of sound.
- SPA 5225 Fluency Disorders** 3 cr (3,0)
PR: Graduate status or C.I. Identification and evaluation of disorders of rhythm. Emphasis will be on methods of intervention in disorders of fluency.
- SPA 5225L Fluency Disorders Laboratory** 1 cr (0,2)
PR: Graduate status or C.I. Practical application of clinical skills in fluency disorders.
- SPA 5307 Differential Diagnosis of Auditory Disorders** 3 cr (3,0)
PR: SPA 4032, Graduate status or C.I. Clinical techniques in pure tone speech, acoustic impedance and electrophysiologic response audiometry.
- SPA 5327 Aural Habilitation/Rehabilitation** 4 cr (4,0)
PR: Graduate status or C.I. Principles and procedures involved in speech and language acquisition, management, utilization of residual hearing, speech reading and the use of hearing aids.
- SPA 5553 Differential Diagnosis in Speech and Language** 3 cr (3,0)
PR: SPA 6204, SPA 6403, SPA 6211, SPA 5805. Administration and interpretation of evaluation techniques, including standardized tests, will be presented. Emphasis will be on those techniques which allow for differential diagnosis of speech and language disorders.
- SPA 5553L Differential Diagnosis in Speech and Language Laboratory** 1 cr (0,4)
PR: SPA 6204, SPA 6403, SPA 6211, SPA 5805. Students will be assigned to diagnostic teams in which they will apply the techniques presented in SPA 5553. Experiences will include test administration, interviewing, writing of diagnostic reports and oral presentations with staffings.
- SPA 5554 Therapeutic Communication** 3 cr (3,0)
PR: Graduate status or C.I. Practical interviewing and counseling in the area of Communicative Disorders. Emphasis is on facilitating clinician-client interactions.
- SPA 5600 Administration and Management of Communicative Disorders Programs** 3 cr (3,0)
PR: SPA 3002. Methods and techniques for organization and administration of Speech/Language and Hearing Disorders in public school, hospital, rehabilitation center and private practice facilities.
- SPA 5805 Research in Communicative Disorders** 3 cr (3,0)
PR: STA 4163, Graduate status or C.I. This course is designed to introduce the student to empirical research in the area of communication disorders. Emphasis is on hypothesis testing, methodology, analysis and interpretation of results.
- SPA 6132 Measurements in Speech Science** 3 cr (1,4)
PR: Graduate status or C.I. The application of instrumentation to research in normal speech and language behaviors. Measurements include use of electronic instruments, such as the oscilloscope.
- SPA 6204 Advanced Studies in Communicative Disorders: Articulation** 3 cr (3,0)
PR: SPA 3112, SPA 3112L, SPA 4201. Advanced theory, diagnostic techniques and therapeutic procedures for articulation disorders. May be repeated for credit.
- SPA 6204L Advanced Studies in Communicative Disorders: Articulation Laboratory** 1 cr (0,2)
PR: SPA 3112, SPA 3112L, SPA 4201. Practical application of clinical skills in articulation disorders. May be repeated for credit.
- SPA 6211 Voice Disorders** 3 cr (3,0)
PR: SPA 3101. Basic principles and practices in the treatment of organic voice pathologies including laryngectomy, cleft palate and other disorders of the vocal mechanisms.
- SPA 6211L Voice Disorders Laboratory** 1 cr (0,2)
PR: Graduate status or C.I. Practical application of clinical skills in voice disorders.
- SPA 6308 Auditory Evaluation and Assessment Procedures for Special Populations** 4 cr (4,0)
PR: Graduate status or C.I. Audiometric testing and functional communicative assessment procedures for geriatric, pediatric, and other special populations.

- SPA 6345 Amplification** **4 cr (4,0)**
 PR: Graduate status or C.I. Hearing aids, selective evaluation procedures, electro-acoustic measurements, coupling techniques, and orientation and counseling.
- SPA 6353 Hearing Conservation** **4 cr (4,0)**
 PR: SPA 4032, SPA 5120. Industrial audiometry, community noise abatement and public school hearing conservation.
- SPA 6403 Advanced Studies in Communicative Disorders: Language** **4 cr (4,0)**
 PR: Graduate status or C.I. Presentation of the syntactic, semantic and pragmatic nature of children's language disorders. Emphasis will be on techniques and methods of diagnosis and intervention with children from birth through adolescence. May be repeated for credit.
- SPA 6410 Language Problems in Adults** **4 cr (4,0)**
 PR: SPA 4251, Graduate Status, or C.I. A study of the language disorders in adults associated with neurological problems, brain injury, systemic disease, and aging.
- SPA 6505 Clinical Practicum in Speech Pathology-Language** **3 cr (0,6)**
 PR: Graduate status or C.I. Advanced clinical practice in communicative disorders. May be repeated with change of content.
- SPA 6506 Clinical Practicum in Audiology** **3 cr (0,6)**
 PR: SPA 4032. Advanced clinical practice in communicative disorders. May be repeated with change of content.
- SPA 6908* Directed Independent Studies** **1-6 cr**
- SPA 6918* Directed Independent Research** **1-6 cr**
- SPA 6938* Special Topics/Seminars - May be repeated for credit.** **1-6 cr**
- SPA 6946* Internship, Practicums, Clinical Practice** **1-6 cr**
- SPA 6971* Thesis** **1-6 cr**
- HSC 6971* Thesis** **1-6 cr**
- ZOO 5745C Essentials of Neuroanatomy** **4 cre (3,2)**
 PR: Human/Comparative Anatomy, or Human/Animal Physiology or C.I. Fundamental concepts of both morphological and functional organization of the nervous system. Primary emphasis on human structure.

*Must present at registration an authorization form which is obtained from the department office.

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