# Bulletin: General Catalog Issue 2022-2023 

Portland State University

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## PORTLAND STATE UNIVERSITY

## 2022-2023 BULLETIN

# BULLETIN <br> 2022 / 2023 



Information in this Bulletin is accurate as of June, 2022. It has been compiled with care but may contain errors. Any errors discovered should be reported to the Office of Academic Affairs.

The PortlandState University Bulletin is not a contract but rather a guide forthe convenience of students. The University reserves theright to change or withdraw courses; to change the fees, rules, and calendar for admission, registration, instruction, and graduation; and to change other regulations affecting the studentbody, at any time.
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P.O. Box 751

Portland, OR 97207-0751
PSU Admissions: 503-725-3511
PSU Main Line: 503-725-3000
Toll Free: 1-800-547-8887
www.pdx.edu

## ACADEMIC CALENDAR



## WELCOME TO PORTLAND STATE UNIVERSITY

## Vision, Mission and Values

Our vision: Portland State University leads the way to an equitable and sustainable future through expanding opportunity, serving our city, and promoting academic and research excellence.

## Our mission:

- We serve and sustain a vibrant urban region through ourcreativity, collective knowledge and expertise.
- We are dedicated to collaborative learning, innovative research, community engagement, and career preparation.
- We educate a diverse community of lifelong learners.
- Our research and teaching make a global impact.

Our values:

- We promote access, inclusion, and equity as pillars of excellence.
- We commit to curiosity, collaboration, stewardship, and discovery.
- We strive for problem-solving innovation.
- We believe everyone should be treated with integrity and respect.


## Engaged with the community

With 27,000 students, Portland State University is a nationally recognized leader in community eng agement, combining academic rigor in the class room with community-based learning.

Students fromwithin Oregon, throughout the United States, and across the world choose Portland State because its urban setting and ties to businesses and service organizations make it a living laboratory that prepares tomorrow's leaders with the experience they need to succeed.

Portland State's growing reputation for excellence prompted U.S. News \& W orld Report to rankPSU among the "most innovative" universities in the nation for the last several years.

## Distinguished Programs and Faculty

Many of Portland State's dis ciplinary programs are nationally ranked in the top 20 in the United States, and the Princeton Review lists PSU among its BestColleges.

The innovative University Studies program, a four-year general education program which promotes communitybased, interdisciplinary learning, and engagement in realworld problems, has established Portland State as a national model for other colleges and universities.

The University Honors College is the only urban-focused honors college in the country. Here, a small, dedicated community of highly motivated students and engaged professors explore an academically intense curriculum through the lens of the culturally rich, ever-evolving city of Portland.

Portland State professors are prized for theirknowledge, research and service. Faculty come to Portland State from colleges and universities around the world. Though diverse in culture, background, language, and ethnicity, they come to Portland unified in their commitment to the University's exceptional approach to learning and engagement.

PSU's motto, "Let knowledge servethe city," ins pires faculty research. Many professors research some of society's greatest challenges-providing students with firsthand knowledge and opportunities for involvement and collaboration in their communities. Faculty use their expertise to serve the region through their work with businesses, not-for-profits, and governmental agencies and by holding key posts in professional, cultural, and civic groups.

## Portland: The community is our campus.

Portland State University's prized location in the middle of a major city guarantees students are always steps from excitement and action. Parks, museums, cafes, theaters, shopping, acclaimed restaurants, and professional sports are all close.

Established in 1946 to meet the educational needs of GIs home from World War II battlefields, Portland State found its first home in Vanport, a former federal housing project along the Columbia River. The campus moved to Lincoln Hall in Portland's South Park Blocks in 1952 and now encompasses 50 city blocks, retaining a park-like beauty within its urban setting.

Students and faculty often gather in the Park Blocks to talk or study. PSU's Urban Center stands at the busiest public transportation hub in the city. It's the only location in the city where TriMet's bus system, Portland Streetcar, and MAX light rail line come together. Thousands of students get to campus under their own power, commuting by foot or bicycle along Portland's pedestrian and bike-friendly streets.

With urban sophistication, small-town accessibility, and many outdoor activities, Portland and Portland State offer a great living and learning experience.

## Sustainability: It's what we do.

In 2016 Sierra magazine ranked PSU 14th in the nation, and first in Oregon, for its commitment to sustainability. Sierra commended PSU for its innovative strategies for reducing waste, conserving resources, and advancing environmental research.

The Portland State campus itself is a model for sustainability; each new building or major renovation on campus since 2004 has received a Leadership in Energy and Environmental Design (LEED) certification.

Portland State students can take sustainability les sons beyond theclassroom, en gaging directly with the community and businesses to solve real-world problems and achievefurther sustainability at the local and regional levels. Portland State strives to harness the strengths of the univers ity to move closer to solving the environmental, social, and economic problems of our time.

Faculty and students are performing valuable research and developing solutions to address issues related to homeles sness, climate change, public health, and urbanization. Students in departments across campus consider is sues that integrateeconomic, social, and environmental viewpoints. Armed with this knowledge and experience, they will join a generation of leaders building a more equitable, livable, resilient world.

## Research \& Graduate Studies

PSU is the region's leading urban research university and offers wide-ranging research opportunities for undergraduate and graduate students who aspire to be explorers, innovators, problem-solvers, and changemakers.

Our faculty includes internationally recognized researchers in engineering and physical, natural and social sciences, as well as the arts andhumanities. PSU researchers are making vital contributions in fields ranging from climate science to the development of new treatments for dis eases and the search for life beyond Earth. Our res earch strengths in specialized fields such as early childhood learning and biochemistry attract world-class partners like the Howard Hughes Medical Institute. And programs like NIH-funded Build EXITO provide students with access to cutting-edge research as well as training and professional development opportunities. Opportunities to explore entrepreneurship and commercialization of student and faculty intellectual property are provided through Propel PSU's Center for Entrepreneurship, Innovation and Intellectual Property, and
the Portland State Business Accelerator.
Researchers at PSU work across disciplines and partner with industry, government agencies, nonprofit org anizations, and other universities to address the critical challenges of the 21st century and improvelife in Oregon, the nation, and the world. We collaborate with Oregon Health \& Science University through the OHSU-PSU School of Public Health and interdis ciplinary research where our expertise in data analysis, social science, biology, and chemis try add value to OHSU's clinical studies. Our University Research Centers work to improve urban life by evaluating "smart city" technologies, exploring solutions to complexis sues such as homeles sness, and improving transportation. At PSU, we bring the future into focus.

## The Founding of Portland State University

Portland State University's roots trace back to the summer of 1946 when the Oregon State Board of Higher Education approved the opening of a temporary school in North Portland to offer lower-division coursework. Vanport Extension Center(VEC), named for its location between Portland and Vancouver, was situated in Vanport City, a wartime hous ing project that promised res ident and clas sroomspace for the students attending VEC. Spearheaded by founder and director, Stephen Epler, VEC soon became known as "Vanport College" and was immediately successfulin meeting local demands for higher education by returning W orld War II servicemen and women. When fall term regis tration closed at VEC, more than 1,400 students enrolled, eclipsing the projection of 500 and signaling future success for the center.

Seemingly ending VEC's future, the 1948 Memorial Day flood of the Columbia River destroyed Vanport City, including the center. Epler and his colleagues kept the school alive, using federal funds to reinstate the campus at "Oregon Ship," a former Oregon Shipbuilding Corporation site. The school's commitment and fighting spirit earned it the national reputation as "the college that would not die." Students, faculty, community groups, and legislators were strong advocates for the school, spurring its permanence and move in 1952 to its present location in Portland's South Park Blocks, where it became the Portland State Extension Center in the former Lincoln High School (now Lincoln Hall).

In 1955, the legislaturecreated Portland StateCollege as a four-year degree-granting institution. Graduate work was added in 1961; doctoral programs began in 1968, and the
institution became Portland State University in 1969. The University has grown froman initial enrollment of 1,410 students in 1946 to become one of Oregon's largest universities.
"Portland State formed a legacy of courage, leadership, dedication, and collaboration during its founding years, 1946-1955. These qualities enabled a smallextension center to become a four-year, degree-granting college. Today this legacy ins pires Portland State University to enhance the intellectual, social, cultural, and economic vitality of Portland, the Pacific Northwest, and beyond." ${ }^{1}$

## The Founder and presidents who have served the University are:

- Stephen E. Epler (Vanport Extension Center), 1946 to 1952;
- John F. Cramer, 1955 to 1958;
- Branford P. Millar, 1959 to 1968;
- Gregory B. Wolfe, 1968 to 1974;
- Joseph C. Blumel, 1974 to 1986;
- Natale A. Sicuro, 1986 to 1988;
- Roger N. Edgington (interimpresident), 1988 to 1990;
- Judith A. Ramaley, 1990 to 1997;
- DanielO. Bernstine, 1997 to 2007;
- MichaelF. Reardon (interimpresident), 2007 to 2008;
- Wim Wiewel, 2008 to 2017;
- Rahmat Shoureshi, 2017 to 2019; and
- Stephen Percy, (interimpresident 2019 to 2020) appointed president 2020-present.
${ }^{1}$ From Creating Portland State: 1946-1955.


## Accreditation

Portland State University is accredited by the Northwest Commission on Colleges and Universities.

Accreditation of an institution of higher education by the Northwest Commission on Colleges and Universities indicates that it meets orexceeds criteria for the as sessment of institutional quality evaluated through a peer review process. An accredited college or university is one which has available the necessary resources to achieveits stated purposes through appropriate educational programs, is substantially doing so, and gives reas onable evidence that it will continue to do so in the foreseeable future. Institutional integrity is also addressed through accreditation.

Accreditation by the NorthwestCommis sion on Colleges and Universities is notpartial but applies to the institution as a whole. As such, it is not a guaranteeof every course or programoffered, or the competence of individual graduates. Rather, it provides reasonable assurance about the quality of opportunities available to students who attend the institution.

Inquiries regarding an institution's accredited status by the Northwest Commis sion on Colleges and Universities should be directed to the adminis trative staff of the institution. Individuals may als o contact:

Northwest Commis sion on College and Universities 8060 165th Avenue N.E., Suite 100

Redmond, WA 98052
(425) 558-4224
www.nwccu.org
In the College of Liberal Arts \& Sciences; the Department of Speech and Hearing Sciences is accredited by the Council on Academic Accreditation (CAA) of the American Speech-Language Hearing Association (ASHA). The Department of Chemistry is accredited by the American Chemical Society (ACS).

In the College of the Arts; the School of Music \& Theater's bachelor's and master's programs are accredited by the National Association of Schools of Music (NASM). Theater programs are accredited by the National Association of Schools of Theater (NAST). The Master of Architecture degree in the School of Architecture is accredited by the National Architectural Accrediting Board (NAAB).

In the College of Urban and Public Affairs; the Master of Urban and Regional Planning degree is accredited by the Planning Accreditation Board (PAB). The Master of Public Administration and the Executive Master of Public Administration are accredited by the Network of Schools of Public Policy, Affairs and Administration(NASPAA). The Master of Public Adminis tration - Health Administration is accredited by the Network of Schools of Public Policy, Affairs and Adminis tration (NASPAA).

In the College of Education; teacher and administrator education programs are accredited by the Council for the Accreditation of Educator Preparation (CAEP) and by the Oregon Teacher Standards and Practices Commis sion (TSPC). The counseling programs are accredited by the Council for Accreditation of Counseling and Related Educational Programs (CACREP). The Helen Gordon Child DevelopmentCenter is accredited by the National Association for Education of Young Children (NAEYC).

In the Maseeh College of Engineering and Computer Science; undergraduate programs in civil, computer, electrical, environmental, and mechanical engineering are
accredited by the Engineering Accreditation Commission of the ABET. The computer science program is accredited by the the Computing Accreditation Commission of ABET. Contact information for ABET can be found at www.abet.org/contact-us.

In the School of Business; the undergraduate and graduate business programs as well as the accounting programare accredited by The Association to Advance Collegiate Schools of Business International (AACSB).

In the School of Public Health; the undergraduate programs in Applied Health andFitness, and Public Health Studies, the Master of Public Health degrees, the Master of Science in Biostatistics, and the Ph.D. programs in Community Health, Epidemiology, Health Systems and Policy are all accredited by the Council on Education for Public Health (CEPH). The Health Management \& Policy MPH is also accredited by the Commission on Accreditation of Healthcare ManagementEducation (CAHME).

In the School of Social Work; both thebachelor's and the master's programs are accredited by the Councilon Social Work Education (CSWE). The Child, Youth, \& Family Studies certificate programis accredited by the National Council on Family Relations (NCRF).

## ADMISSIONS REQUIREMENTS

## U.S. Citizens and Immigrants (Domestic Undergraduate Applicants)

## Application

Domestic students must submit the following information to the Office of Admissions.

## 1. Application submission and nonrefundable

fee. Students should apply at www.pdx.edu/admis sions or via the Common Application online. To ensure consideration for admission, students should submit their application by the establis hed deadline for their intended start termand submit the nonrefundable $\$ 60$ application fee (fees subject to change without notice) when applicable. The application and nonrefundable $\$ 60$ fee are valid for three terms from the first admission term.
2. Admission validation. To validate admission, the student must register forclasses and enroll during their intended termof admission as selected on their application. If the student does not register and enroll for their first term, the application may be updated to oneof the next three consecutive terms without repaying the application fee; applicants will not be updated automatically. After this update period, applicants must submit a new application along with another $\$ 60$ application fee.
3. Official transcripts. Transcripts must be submitted directly by each high school or college attended. Transfer students who have earned fewer than 30 quarter credits of transferable college coursework are also required to submit official high school transcripts. In addition, all applicants who graduated froman Oregon high school in 1997 or after will be required to submit a high school transcript to validate their Second Language graduation requirementif it was met in high school.
To be considered "official," transcripts mustbe received by PSU in the sealed (unopened) original envelope or through approved electronic means fromthe is suing school. Since all official transcripts submitted become the property of PSU and cannot be copied, returned to the student, or shared with other institutions, students are encouraged to obtain unofficialcopies of their transcripts from prior institutions for advising or personal purposes.
4. SAT or ACT scores (Optional). Applicants who satisfy Portland State's minimumcurriculumand GPA requirements are not required to submit testscores. ACT and SAT scores submitted by students who are admis sible based on GPA and high school curriculum will only be considered as "value added" in the admis sion process.

NOTE: Applicants who attended homeschool, or a nonaccredited, non-standard high school, are required to submit test scores. In order for scores to be considered "official," reports must be sent directly fromthe respective testing agencies to Portland State University.
SAT School Code is 4610
ACT School Code is 3492
Important: Altered transcripts and falsified applications.
Students who knowingly submit altered transcripts or falsified applications jeopardize their admission status and may have their admis sion rescinded and/or their regis tration canceled; in some cases, future application opportunities may also be denied. These penalties may also apply in cases in which transcripts are knowingly unreported to or withheld fromPortland State University.

## Admissions Professional Conduct Policy

Meeting Portland State University's minimum admiss ions requirements alone does not guarantee admis sion to the University. PSU may evaluate an applicant's behavior and background throughout the application process to determine their ability to adhere to the University's academic and professional conductstandards. This evaluation may take into consideration current behavior and performance as well as pastexperiences and actions in the context of an application for admission.

All records submitted, filed, and accumulated in the Office of Admissions become the property of the University. The number of students admittedfor any term is subject to the availability ofspace. When space is limited, selection may be based on grade point average, date of application, intended major, test scores, etc.

## Admission Requirements-Entering Freshmen

To be admitted as freshmen, applicants need to fulfill each of the requirements (or alternatives) as specified in all of items 1-4 below.

1. High school graduation requirement. Applicants must have graduated froma standard or regionally accredited high school. Students who have not graduated from a standard orregionally accredited high school may meet entry requirements through alternative testing. Alternativetesting includes successful completion of one of the following:

- Test ofGeneral Education Development (GED):
- Applicants with an overallaverage GED score of 151 or above on the latest form of the GED exam will be considered holis tically for admis sion to PSU. Takers of
prior forms of the exam will need to achieve scores listed below.
- If you took the GED between January 1, 2002 and December 31, 2013: earn a minimum overall average score of 580 and a minimum score of 410 on each subject test
- If you took the GED prior to January 1, 2002: earn an overall average score of 46 and a minimum score of 40 on each subject test
- HiSET®
- Minimum score of 15 on each subject test area and a 4/6 on the es say component of the Language Arts-Writing subject test
- TASC®
- Minimum score of 580 on Language Arts-Reading, 560 on Mathematics, 560 on Language Arts-Writing, and at least $6 / 8$ on the Language Arts-Writing essay.


## Non-accredited or non-standard high school graduates:

Students fromnon-accredited or non-standard high schools, or home-school students, may meet the high school graduation requirement with a minimum score of 1120 or higher on the combined Writing \& Language and math portions of the SAT, or with a composite score of 22 on the ACT®.
2. High School Subject requirements. Resident applicants musts atisfactorily (grade of C-or above) complete at least 15 units (one year equal to one unit) of college preparatory work in the following areas, while nonresident applicants must satisfactorily (grade of C - or above) complete at least 13 units (one year equal to one unit):

- a. English (4 units). Must include the study of the English language, literature, speaking and listening, and writing, with emphasis on and frequent practice in writing expository prose during all four years.
- b. Mathematics ( $\mathbf{3}$ units). Must include first-year algebra and should include two additional years of college preparatory mathematics (with the final year equivalent to or greater than the level of Algebra II) selected from geometry (deductiveor descriptive); advanced topics in algebra (through AlgebraII), trigonometry, analytical geometry, finite mathematics, advanced applications, calculus, and probability and statistics, or courses that integrate topics fromtwo or more of these areas. One unit of math is strongly recommended in the senior year. (Algebra and geometry taken prior to ninth grade will be accepted if posted on HS transcript.)
- c. Science (3 units). Must include at leasta year in fields of inquiry based college preparatory science such as biology, chemis try, physics, or earth and physical science. Science courses that are "inquiry based" provide students the opportunity to apply scientific reas oning and critical
thinking to support conclusions or explanations with evidence from their investigations. It is strongly recommended that one year be taken as a laboratory science and that a total of three years of science betaken. Applicants with 2 years of science coursework will not be denied based on admis sion requirements, but may be admitted with a deficiency in coursework.
- d. Social Studies (3 units). Mustinclude analy sis of societal issues andevents. It is strongly recommended that study includes knowledge and use of geographic information, patterns of United States history, patterns of human history, structures and systems of the US Government, and analy sis of economic systems.
- e. Second Language ( 2 units). Must include demonstrated proficiency equivalent to two years of the same high school-level second language. This requirement applies to anyone who graduated froman Oregon high school in 1997 or any year after. Students may demonstrate proficiency by meeting one of the following options:


## High School and College Options

- Pass with a C- or better, two years of the same high school-level second language
- Pass with a C- or better, the third year of a high schoollevel second language
- Pass with a D- or better two quarters or two semesters of college-level second language


## Second Language Proficiency-based Assessment Options

- Score of 2 or higher on an Advanced PlacementForeign Language Test
- Score of 4 or higher on an International Baccalaureate

Standard LevelForeign Language Exam

- Score of 40 or higher on a CLEP Foreign Language Exam
- Score of 500 or higher on an SAT Foreign Language Subject Test if taken in July 2021 or earlier
- Education satisfactorily completed through 7th grade in a school or country where English was not the language of instruction
- Satisfactory performance (P) on a Brigham Young Foreign Language Assessment (BYU FLATS)
- Score of novice-high orhigher on the Standards-based Measurement of Proficiency (STAMP)
- Score of 226 or higher on a Proctored WebCAPE (only offered in Spanish for the Second Language Admission requirement)
- Score of novice-high or higher on the ACTFLscale in American Sign Language (ASL)
- Score of novice-high or higher on a ACTFLOral Proficiency Interview
- Credit for Prior Learning
**American Sign Language qualifies as a second language.

Students failing to meet the Second Language Proficiency requirement at the time of admis sion may be admitted, but will not be able to earn an undergraduate degree at Portland State University until the second language requirement has been completed. Students must provide official high school or college transcripts to demonstrate the Second Language Proficiency Requirementhas been met.

## Alternatives to the subject requirements if no standard high school diploma is awarded. (Any one of the following.)

Score an average of 470 or above ( 1410 total) on the SAT II subject exams (English Composition, Math LevelI or IIc, and a third test of the student's choice) if taken before July 2021.

Score 1120 on the combined SAT Math and Verbal reasoning sections.
Score 22 on the ACT Composite.
Take make-up coursework for s pecific subject requirements mis sed in high school and achieve a passing grade. Note: Satis factory completion of Math 95 or its equivalent (Intermediate Algebra) fulfills in total the subject requirement in mathematics. Take make-up cours ework for specific subject requirements mis sed in high school and achieve a passing grade. Note: Satisfactory completion of Math 95 or its equivalent (Intermediate Algebra) fulfills in total the subject requirement in mathematics.
3. Grade point average requirement. High school students with a cumulative unweighted grade point average of at least 3.00 in all graded subjects taken toward high school graduation. Students who do not meet the 3.00 GPA requirement may be admitted based onholistic review.

NOTE: Beginning with the 2020-2021 academic year Portland State University changed its minimum admis sion high school GPA requirement for first-year applicants to a 2.5 or higher GPA for regular admis sion, with applicants
who did not meet a 2.5 GPA eligible for holistic review. This requirement adjustment may be extended or may end at the discretion of the University Faculty Senate. The current status of this temporary adjustment will be found at www.pdx.edu/admis sions.

## Admission Requirements-Transfer Students

To be admitted as a transferstudent, applicants must have a minimum GPA of 2.25 in 30 transferable quarter credit hours of college work. Applicants who present a trans ferable associate's degree or an Oregon Transfer Module (OTM) will be admitted with a minimum cumulative transferable GPA of 2.00. Students whohave accumulated fewer than 30 transferable credits of college work must also meet the freshman admis sion requirements.

1. Writing proficiency requirement. To be admitted as a transferstudent, applicants must satisfactorily complete a writing course satisfying one of the University's writing requirements (e.g.WR121) or its approvedequivalent with a C- or better.
2. Second language proficiency requirement. All resident applicants must meet the second language proficiency requirement described in 2e of the Freshman Admission Requirements section (p.4).
3. Academic probation/disqualification from other institutions. Academic probation/disqualification will not affect the admissibility of a student whose complete academic record meets the minimum admis sion requirements in effect at the time of application.
4. Disciplinary disqualification. A student who has been disqualified fromanother institution for disciplinary reasons must be eligible to re-enroll at that institution to be considered for admis sion to Portland State University. Students with extenuating circumstances may petition for a waiver of this policy. Other offices on campus may be consulted in evaluating requests for waivers.
After review of circumstances, Portland State University may, for example, ask that you attend a different institution and reapply; decline to accept your application now or in the future; apply other possible conditions or restrictions to your application review.

More information on transferring to PSU is available at www.pdx.edu/admis sions/transfer.

## International Students

## Application

## Undergraduate International Students

## Application

Applicants who are not U.S. citizens who are currently overseas or reside in the U.S. on non-immigrant visas are considered for admis sion as international students. Candidates for admis sion may complete applications for the following terms if submitted by the following deadlines:

## International Freshmen

- 

August 1, 2022: Fall 2022

December 5, 2022: Winter 2023
-
March 5, 2023: Spring 2023

July 5, 2023: Summer 2023

## International Transfer

- 

September 1, 2022: Fall 2022

December 5, 2022: Winter 2023
-
March 5, 2023: Spring 2023
-
July 5, 2023: Summer 2023

## International Postbaccalaureate

- 

September 1, 2022: Fall 2022

December 5, 2022: Winter 2023
-
March 5, 2023: Spring 2023

July 5, 2023: Summer 2023
Applications will be considered for all terms subject to department and/or University res trictions and/or course availability.

International Undergraduate applicants should submit the following information to the Office of International Undergraduate Admis sions. All documents submitted
become the property of PSU and cannot be photocopied, returned, or forwarded to third parties.

## 1. Application submission and $\$ 60$ nonrefundable

 application fee. Students should apply at www.pdx.edu/admis sions or via the Common Application online. To ensure consideration for admission, students should submit their application by theestablished deadline for their intended start termand submit the nonrefundable $\$ 60$ application fee (fees subject to change without notice) when applicable. The application and nonrefundable application fee are valid for one academic year only. The $\$ 60$ fee cannot be waived.2. Official transcripts. To be considered official, transcripts must arrive in the Office of International Admissions in a sealed envelope from the is suing school. Applicants whose admis sion will be based on high school/secondary school graduation should submit official transcripts of their final fouryears of high school/secondary school study or documentation as requested by the office of Undergraduate International Admissions. Transfer students must submit official transcripts fromeach college or university attended, regardles s of whether or not they feel their prior academic study may be relevant to theirPSU study. Transfer students with fewer than 30 quarter credits of college/university coursework are also required to submit transcripts fromtheir final four years of high school/secondary school. Credits fromaccredited schools outside the U.S. will be transferred to PSU according to established international transfer credit guidelines and policies. See Academic Credit section of this Bulletin for more information. Students who knowingly submit altered or falsified academic records or other application documents jeopardize their admission status and may have their admis sion rescinded and/or registration canceled.

## 3. Proof of English language proficiency if seeking

 direct admission to academic cours ework.
## 4. Evidence of adequate financial resources for

 educational and living expenses. (International applicants residing in the United States on vis as other thanF-1 or J-1 student vis as may not be required to submit proof of financial resources.)
## 5. Proof of current immigration status (ifalready residing in the United States).

6. Admission validation. To validate admission, the student must register for clas ses during the initial termof admission. If the student does not register for this term, the application start termcan be changed to one of the next three consecutive terms without repaying the application fee. After this time period, the student must submit a new application along with another $\$ 60$ application fee.

## Admission Requirements for Intemational Students

Applicants must demonstrate an appropriate level of academic preparation.

Freshman: Completion of U.S. academic (university preparatory) high school or secondary school equivalent as determined by the Office of Undergraduate International Admissions with a minimum equivalent 2.50 GPA .
Transfer: Completion of 30 trans ferable college quarter credits, excluding ESL courses, with a 2.25 GPA or higher at a U.S. regionally accredited college/university or foreign equivalent as determined by the Office of International Admis sions. Transfer students who present a transferable as sociate's degree (AS or AA or an Oregon Transfer Module (OTM) will be admitted with a minimum cumulative 2.00 GPA.

English language proficiency requirement. Admitted students who meet the English language proficiency requirement may enroll directly into academic clas ses. Those who do not meet this requirement will be placed in ESL classes until the requirement has been met. Applicants may demonstrate English language proficiency by submitting qualifying TOEFL, IELTS, or PTE scores. See minimum qualifying scores below.
English language proficiency requirements may be found at: https://www.pdx.edu/admis sions/international/english-language-proficiency.
Information on the internationalTOEFL is available at www.ets.org/toefl.

## Intensive English Language Program

Persons seeking English language training only, who do not wish to continue toward university-level academic study, may apply for admission to the Intensive English LanguageProgram(IELP). However, persons who want to study Eng lish before beginning academic study are eligible for conditional undergraduate or postbaccalaureate admission without minimum English language proficiency test scores.
The IELP provides both credit and non-credit classes. Students must have earned the equivalent to a U.S. high school diploma for admis sion consideration. Prospective students must be in legal U.S. immigration status at the time of application.

Contact the Intensive Eng lish Language Program, 503-725-4088 or www.pdx.edu/english-language-programs, for additional IELP requirements.

## Admission to Professional Programs and Schools

Admis sion to Portland State University does not automatically admit students to its professional programs
and schools. Standards for admission andevaluation of transfercredits often exceed general University requirements. Students should check this catalog under the appropriate academic unit to determine if a unit has special admis sion requirements.

## Student Orientation Programs

503-725-5511
www.pdx.edu/admis sions/orientation
The Office of Admis sions coordinates orientation programs for all undergraduate students new to PSU. All newly admitted undergraduate students are required to attend a new student orientation session before registering for courses.

After admis sion to PSU, each undergraduate student must complete orientation programming before their start term. In-person and online programming is available. To sign up for New Student Orientation, the student must have already submitted their enrollment confirmation deposit of $\$ 200$.

Orientation provides students with the opportunity to meet with current PSU faculty, professional staff, and students in orderto:

- Understand academic requirements of a baccalaureate degree
- Successfully develop an academic plan and register for courses
- Access programs and services available to PSU students
- Facilitate the academic and social transition to the

University community
Viking Days takes place the week prior to the start of fall term during the month of September. This is a week of activities, information sessions, open houses, and social events in which new students are invited to attend and encouraged to participate. For further information, visit www.pdx.edu/admis sions/viking-days.

## ACADEMIC RECORDS, CREDIT, AND APPEALS

## Student Records

The University Student Records Policy, in accordance with the federal Family Educational Rights and Privacy Act of 1974 as Amended, governs the collection, use, and disclosure of student records with the goal of ensuring their privacy. Generally it provides the right to non-release of confidential information except as directed by the student, or as provided by law; the right to inspecteducational records maintained by the University; theright to correction of errors, a hearing if necessary, and the right to file a complaint with the U.S. Department of Education. Learn more about studentrecords privacy online at www.pdx.edu/registration/student-records-privacypolicy.

## Documents Submitted to the University

All documents, including transcripts, submitted toPSU become the property of the University and are notintended for duplication or return to the student.

## Academic Record Sealed After Degree Eamed

Portland State University academic records are sealed thirty days after the conferral of a degree. After this date, changes to majors and minors, addition of departmental honors, removal of incomplete grades, gradechanges, changes to degree posting, or other changes to an academic record cannot be made except by decision of the Scholastic Standards Committee or the Graduate Council.

## Academic Credit

The credit hour is the basic unit of measurement of student educational accomplishment and is used to measure progress toward a degree, which in turn enables PSU's programs to be eligible for Title IV Financial Aid programs under the Higher Education Act. At Portland State University the academic credit hour definition is based on the traditional Carnegie unit and complies with the Federal financial aid (United States Department of Education's (USDE) regulations [34CFR 600.02 and 668.8, effective July 1, 2020) and the guidance of the NWCCU.

At PSU, one credit normally connotes 10 hours of lecture or 20 or more hours of laboratory, studio, or activity work. The majority of courses at Portland State University involve three or fourhours per week of lecture-recitation. PSU is on the quarter-systemcalendar. Semester credits transferred from other accredited United States schools may be converted to PSU's credits by multiplying by 1.5 .

The 1.5 multiplication rules apply only to semester credits transferred fromU.S. schools. Semester credits transferred from accredited schools outside the United States will be converted according to established international transfer credit guidelines and policies.

## Academic Credit Overload

## Undergraduate Academic Credit Overload

Undergraduatestudents who enroll in more than 21 credits per term are considered to be in academic overload. PSU audit credits and transfer credit taken at other institutions while concurrently enrolled at PSU are counted in determining overload status. Transfer credits that result in an overload for a given term will not be accepted in transfer unless prior approval has been granted.

Academic overload must be approved on a term-by-term basis as follows:

- 22-25 credits: Students must obtain prior approval from their academic programadviser using the Overload Approval Form, to be submitted to the Office of the Registrar in advance of the overload term.
- 26 or more credits: Students must obtain prior permis sion fromthe Academic Requirements Committee (ARC) by submitting an ARC petition in advance of the overload term. Students must provide justification for the overload and obtain written support from their academic programadviser. Petitions must be submittedusing the Academic Requirements Committee petition prior to the first day of the overload term.


## Graduate Academic Credit Overload

Graduate students must obtain approval for registration in exces s of 16 credits (graduate and undergraduate credits combined) via the Overload Approval form. A student registering for 17 to 19 credits must obtain the approval fromtheir departmentchair or faculty adviser. A student registering for 20 credits or more must obtain the approval of their department chair and the Graduate School. A graduate assis tant registering for more than 16 credits must obtain approval from their department chair and the Graduate School.

Computer Science and Electrical \& Computer Engineering graduate students have a lower maximum regis tration limit of 10 credits. These
students must obtain approval to registerfor 11 or more credits via the Overload Approval form.

## Class standing

Class standing is based on the number of credits a student has completed, according to the following schedule:

| Class Standing | Credits Completed |
| :--- | :--- |
| Freshman | $1-44$ |
| Sophomore | $45-89$ |
| Upper-division <br> standing | 90 or more |
| Junior | $90-134$ |
| Senior | 135 or more |
| Postbaccalaureate | Hold an undergraduate degree <br> froman accredited college or <br> university |

## Appeals and Grievances

Grievances and requests forexceptions to University policies and requirements may be filed with specific committees authorized to deal with specific student concerns.

## Academic Appeals Board

This board hears appeals fromstudents who claimto have received prejudiced or capricious academic evaluation and makes recommendations on cases to the Provost. In such cases the student should first consult with the instructor. If the grievance is not resolved, the student should then contact the department chair, then the dean of the college or school. If the grievance is still not resolved, thestudent may then appeal by writing a letter to the Academic Appeals Board. Appeals may be filed in the Office of Dean of Student Life, 433 Smith Memorial Student Union.

## Academic Requirements Committee (ARC)

The ARC is a subcommittee of the PSU Faculty Senate and is responsible for developing policies and adjudicating petitions regarding academic regulations related to credit loads, transfer credit, degree and certificate requirements for all undergraduate programs. It also develops and recommends policies andadjudicates student petitions reg arding initial undergraduate admis sions, including entering freshmen. The ARCPetition process is managed by an online process accessed at the Academic Requirements Committee Petitions website.

## Deadline Appeals Committee (DAC)

A student may petition this committee to be exempted from published registration deadlines for the current term
when mitigating circumstances prevent deadline compliance. Petitions must include documentation of the reas on for missing the deadline.
The petition may be accessed at www.pdx.edu/registration/dac.

For further information students may call 503-725-3220.

## Scholastic Standards Committee (SSC)

The SSC is a Faculty Senate committee charged with developing and recommending academic standards to maintain the integrity of the undergraduate programand academic transcripts of the University; developing, maintaining and implementing protocols regarding academic changes to the undergraduate transcript; reviewing and ruling on petitions for any retroactive change to the academic record such as a grade option change, drop, add, and extension of an incomplete beyond the one year deadline; and adjudicating student petitions for academic reinstatement to the University. Conferral of an accredited transferable Associate's or Bachelor's degree constitutes automatic reinstatement to the University once an official copy of a transcript with degree posted is presented to the Office of the Registrar. Petition forms to make retroactive changes to undergraduate academic record, or to seek reinstatement to the University may be obtained at www.pdx.edu/registration/petitions. Forms may also be obtained at the Registrar's Office, FMH Lobby. For further information call 503-725-3220.

## ENROLLMENT

## Enrollment Process

## Registration

Students who have been formally admitted or who have filed a Non-Degree Entry formmay register for clas ses online at www.banweb.pdx.edu during the preregistration period for a given term. Registration dates are determined by student class level and admis sions status and are listed in the academic calendar under priority regis tration at www.pdx.edu/reg istration/academic-calendar. A current, detailed listing of termcourse offerings can be found in the online Class Schedule at www.sa.pdx.edu/soc. Detailed instructions for reg is tration, priority registration dates, drop and add deadlines and academic calendar can be found online at www.pdx.edu/registration. The class schedule is available approximately eight weeks before the beginning of clas ses for winter and spring, and available in May for the following fall term.

The academic calendar contains deadlines related to adding and dropping clas ses, making grade changes, withdrawing from classes, and refund percentages. These deadline dates are important as they determine the extent of financial obligation incurred by reg is tration activity and they determine if and how a course registration will be recorded on a student's transcript. Students who withdraw or drop may be entitled to certain refunds of fees paid. See the Academic Calendar at
www.pdx.edu/registration/academic-calendar.

## Non-attendance

Students are responsible for dropping courses they do not wish to attend. Non-attendance does not cancel tuition charges, nor does it prevent the course and grade from appearing on the student's academic record. The University reserves the right to drop students who do not attend classes or do not have the proper prerequisites. Some academic departments adminis tratively drop student who not not attend class on the first class meeting. If this happens, the student 1) remains responsible for any tuition charges as sociated with the registration, and 2) the course may be recorded permanently on the academic record, depending on when the department processes thedrop. Students with mitigating circums tances who cannot attend class on the first day should notify the instructor or academic department as soon as possible to avoid being administratively dropped. Note: Students receiving state or federal aid who receive all $\mathrm{X}, \mathrm{M}, \mathrm{NP}, \mathrm{W}$, orF grades for a term whose attendance during that termcannot be verified, are subject to having all their funds returned.

## Academic Advising Requirements

## Advising at Orientation

All new undergraduates, both freshmen and transfer students, are required to participate in New Student Orientation where they will learn about Portland State University's academic curriculumand resources, connect with an academic advis or and be given permission to register for their first term at Portland State.
Orientation http://www.pdx.edu/admis sions/orientation

## First-year Advising Requirement

All newly admitted undergraduates are required to connect with their as signed advisor within the first two terms of enrollment in order to register for their third term. For example, students admitted in fall term must receive advising during fall or winter terms in order to enroll for spring termor a hold will prevent themfrom being able to register.
First-Year Advising Requirement:
www.pdx.edu/advising/first-year-mandatory-advising
Find Your Advis or: http://www.pdx.edu/advising/advisinglocations

## Residency Classification

At PSU tuition for Oregon residents is different fromthat of non-residents. The rules used in determining residency seek to ens ure that only bona fide Oregon residents are as sessed the resident fee. The Residency Standards used to as sess residence classification may be found at www.pdx.edu/registration/residency-requirements.
Only the Office of Admissions and the Residency Officer have authority to apply and interpret these rules and procedures. No other indication or determination of residency by any other institutional office, department, program, or staff represents the official institutional determination of residency.

## Residency Classification Appeals

A student may appeal their residency determination by submitting a Residence Information Affidavit with the Residency Officer in the Office of the Registrar. Information about the appeal process may be found at www.pdx.edu/registration/residency-review.

## Undergraduate Students Returning to PSU After an Absence

Former Portland State University students who have been absent for two or more terms, and/or attended another college or university since leaving PSU should complete the online Re-enrollment RequestFormat www.pdx.edu/registration/re-enrollment. Official transcripts must be submitted fromeach institution attended since leaving PSU.

## Part-Time Students/Non-Degree Students

Part-time and non-degree students are subject to the same rules as full-time and admitted students with regard to Academic Standards (academic warning, probation, dismissal) and registration deadlines (drop, add, tuition refunds, grade option changes etc.). Tuition payment is required by published deadlines.

## Part-time students

Part-time status is defined as enrollment in fewer than 12 credit hours for undergraduates, and fewer than 9 credits for graduate students. Credit work taken as a part-time student is acceptable for undergraduate degrees and credentials. A fully admitted student may earn most University degrees as a part-time student. Part-time students should meet regularly with an adviser for academic planning and information on up-to-date requirements and University policies.

## Non-degree/non-admit students

A student may take a maximum of 8 credits in fall, winter and spring terms, and 21 in summer without applying for formal admission. A Non-Degree Entry formis used to create a student record and provide access to the regis tration system. There is a one time, nonrefundable fee. Non-degree students do not qualify for financial aid nordo they receive transfer credit evaluations. Non-degree students are allowed to preregister after admitted students. Students may apply online, or obtain a Non-Degree Entry form at www.pdx.edu/admis sions/non-degree-applicant.
Students who wish to take 9 or more credits in fall, winter, or spring terms mustbe formally admitted to the University. Students who plan to earn a degree at PSU should be admitted as soon as possible. Regardless of how many credits are earned while in non-degree status, there is no guaranteeof admission. Formal admission is required to earn a degree.

## Postbaccalaureate Status

Students seeking admis sion who have earned an accredited baccalaureate degree, who have notbeen admitted to a graduate degree programmay be admitted and enroll at the
postbaccalaureate level. These students are admitted to Portland State toearn a second bachelor's degree, certificate, complete pre-requis ites for admis sion to graduate school, or take other academic credit.PSU students who have completed an undergraduate degree who wish to complete a second undergraduate degree or take 9 or more credits during fall, winter or spring terms or more than 21 in the summer, must be admitted to postbaccalaureate status. Pos tbaccalaureate students are subject to the same academic policies as undergraduates.

## Senior Citizen Enrollment

PSU waives tuition forcourses audited by an Oregon resident 65 years of age or older if:

1. space is available after degree-seeking students have registered
2. the instructor or department approve, and
3. the auditing student is a non-degree-seeking student and is registered for 8 or fewer credits per term.
One-time administrative fees (e.g., $\$ 25$ for program enrollment) and additional course-specific fees for materials and online access may apply. Regis tration, advising, and enrollment support are provided through the Senior Adult Learning Center (SALC).
The tuition waiver does not apply to courses with Restricted Differential Tuition. Seniors taking classes for credit pay tuition according to the established tuition schedule.
SALC receives no direct financial support fromeither the State of Oregon or PSU. The programrelies on charitable contributions fromSenior Auditors and other friends of SALC.

For further information, pleaseemail SALC (salc@pdx.edu) or vis it the SALCwebsite (www.pdx.edu/senior-adult-learning-center).

## Veteran Educational Benefits Certification

503-725-8380
Most programs at Portland State University are approved for the training of veterans. The Veterans Administration requires that any veteran receiving GI Bill® benefits while attending PSU is required to obtain transcripts fromall previously attended schools and submit themto the VA School Official for review for prior credit. Transcripts submitted fromall previously attended schools to the Admis sion Office will be acces sible to the VA School Official. It is not necessary to submit two copies. Each term, after regis tration, veteran students intending to use their education benefits must submit the Online Veterans Certification form. Course adds, drops, withdrawals, class
cancellations and changes of programmade after submitting the veterans certification formmust be reported as soon as possible to the Veterans Certification Office, FMHLobby.
GI Bill® is a registered trademark of the U.S. Department of Veterans Affairs (VA). More information about education benefits offered by VA is available at the official U.S. government Web site at
https://www.benefits.va.gov/gibill.

## Academic Credit for Military Training

After admis sion, credit may be granted for some types of military service courses on the college level where equivalency toPortland State courses can be shown, as informed by the ACErecommendations. Veterans should provide transcripts fromappropriate military schools and a copy of VA form DD214 to the Veterans Certification unit of the Office of the Registrar upon application to PSU.

## Veteran Priority Registration

Portland State University offers early, priority registration to students using veterans' educational benefits and to veterans and military members who submit appropriate documentation. Priority regis tration supports timely programcompletion in compliance with Oregon House Bill 2565. Students being certified by the Registrar's Office for federal VA educationalbenefits will automatically be given veteran priority registration. Other veteran and military members can submit a copy of the DD-214 is sued under honorable or general conditions to show proof of service in order to be enrolled in veteran priority registration. Submit DD214 to o the Veteran Certification Office in the FMH Lobby or to vetcert @pdx.edu.

## Satisfactory Progress Standards

In order to maintain satisfactory progress, the student veteran must complete the following credits:

| Certified for: | Undergraduate: | Graduate: |
| :--- | :--- | :--- |
| Full time | $12+$ credits | $9+$ credits |
| Three-quarter time | $9-11$ credits | $7-8$ credits |
| One-half time | $6-8$ credits | $5-6$ credits |

The cumulative GPA at Portland State University required to maintain satisfactory progress is 2.00 . VA benefits cannot be certified unless satisfactory progress standards are maintained.
One hundred and eighty (180) credits are required to graduate with a baccalaureate degree (the total is greater in some programs ). Grades of No Pass, withdrawals, Incomplete, $X$ and audits do not count toward credits completed and may result in a VA overpayment.

## Last Date of Attendance Reporting

For reporting purposes, the last date of attendance is established using either 1) the actual date recorded in the regis tration system when a course is dropped or withdrawn from, or 2) by the 'last dateattended' provided by instructors when X and NP grades are submitted.

## Reporting Changes in Your Enrollment

Any changes to a student's schedule, including both adding and dropping courses, must be reported to the Veterans Certification Office immediately as thesechanges may have a direct effect on benefits paid by the VA. Immediate notification of these changes can prevent over payments and thus prevent future problems with the VA.

## Deployment Policy

Any student with orders to reportfor active military duty may drop courses at any time during the term and receive a full refund. If sufficient course work has been accomplished and theinstructor feels justified in granting credit for the course work completed, credit may be granted and norefund will be given.
The Office of the Registrar will work with students on a case-by-case basis to determine the best course of action. Students called to active military duty generally have the following options:

- Full drop from all courses at any point during the term without academic or financial penalty, with full tuition and fee refund.
- Drop from some (but not all) courses at any point during the term without academic or financial penalty. Students who have completed a significant portion of their course work may be eligible to receive the grades earned in courses up to that point in time and/or request incomplete grades according to existing guidelines. Tuition would be refunded for withdrawn courses.
- Maintain registration in all courses. Students who have completed a significant portion of their course work may be eligible to receive the grades earned in courses up to that point in time and/or request incomplete grades according to existing guidelines. No tuition would be refunded.
A determination on which option is best for the student will depend on the student's personal details, the time remaining in the term, the portion of coursework completed at the time of military activation, and the judgment of the instructors. Students called to active duty who want to drop courses or dis cuss other options, should bring a copy of their orders to the Veterans Certification Office, FMHLobby and speak with a Veterans Certification Officer.


## Veterans Access Choice and Accountability Act of 2014 (38 U.S.C. 3679(c))

In compliance with the Veterans Access, Choice \& Accountability Act of 2014, the following individuals shall be charged the in-state rate for tuition and fees purposes:

- A Veteran using educational as sistance under either chapter 30 (Montgomery G.I. Bill® - Active Duty Program) or chapter 33 (Post-9/11 G.I. Bill®), of title 38, United States Code, who lives in the State of Oreg on while attending a school located in the State of Oregon (regardless of his/her formal State of residence) and enrolls in the school within three years of dis charge or release from a period of active duty service of 90 days ormore.
- Anyone using transferred Post-9/11 GI Bill® benefits (38 U.S.C. § 3319) who lives in the State of Oregon while attending a school located in the State of Oregon (regardles s of his/her formal State of residence) and enrolls in the school within three years of the transferor's discharge or release from a period of active duty service of 90 days or more.
- Anyone using benefits under the Marine Gunnery Sergeant John David Fry Scholarship (38 U.S.C. § 3311(b)(9)) who lives in the State of Oregon while attending a school located in the State of Oregon (regardles s of his/her formal State of residence) and enrolls in the school within three years of the Service member's death in the line of duty following a period of active duty service of 90 days or more.
- Anyone described above while he or she remains continuously enrolled (other than during regularly scheduled breaks between courses, semesters, or terms) at the same school. The person sodescribed must have enrolled in the school prior to the expiration of the three year period following discharge, release, or death described above and must be using educational benefits under either chapter 30 or chapter 33 , of title 38 , United States Code.

GI Bill® is a registered trademark of the U.S. Department of Veterans Affairs (VA). More information about education benefits offered by VA is available at the official U.S. government Web site at https://www.benefits.va.gov/gibill.

## Missed Class Policy

Purpose: This policy is to providestudents who miss class orexaminations a process to make up examinations or other graded in-class work, unless it can be shown that such an accommodation would compromise essential learning outcomes or constitute an unreasonable burden on the instructor.

Rationale: Portland StateUniversity recognizes that students carry many responsibilities with theminto the
classroom, which may both enrich theireducational experience and make it more challenging. These include univers ity-sanctioned activities in which the student serves as a representative to the university such as student congress, athletics, drama, and academic meetings.

## Applicability:

- Students involved in university sanctioned or other legitimate activities, such as illness and family emergency.
- Activity programdirectors.
- Ins tructors of students who participate in universitysanctioned activities, including faculty, academic professionals, adminis trative staff, and teaching ass is tants.

Policy: It is the responsibility of each ins tructor to determine and publish the class attendance policy in the course syllabus and dis tribute to the enrolled students at the beginning of thequarter. The instructor may approve absences at their discretion, in accordance with this policy. It is the responsibility of the student to informthe instructor of absences dueto university-sanctioned events or pers onal responsibilities in writing at the earliest possible opportunity. If a student mustmiss class due to an unforeseenevent, the student mustinform the instructor of the reas on for the absence. Absences not cleared with an instructor before the specific clas sevent (exam, presentation, as signment due) may
require documentation/substantiation at the instructor's discretion. If the instructor decides that the absence is justifiable, then they should attempt to provide opportunities for equivalent work. When absences are approved beforehand by the student and ins tructor, the instructor will allow students to make up mis sed work and/orgive an option to attain attendance points. When there is a dispute between students and instructors over the opportunity to make up work or attendances, the issue will be adjudicated by the chair of the department and then (only if needed) the dean of that school or theirr designee. The student may not place any undue burden on the instructor to provide opportunities to make up course work due to excused absences.

## TUITION AND FEES

## Student status

New and continuing students at Portland State University should plan their study programs and workloads with a knowledge of the fee and tuition schedules of the institution. The Portland State Board of Trustees reserves the right to change the schedule of tuition and fees without notice. Additionally, certain charges set by the University are also subject to change.

Most laboratory and class materials are included in the tuition and fees payment, but certain classes do require special deposit charges, surcharges, or costs to cover materials. These charges are listed in the class descriptions under the PSU Clas s Schedule registration page located at sa.pdx.edu/soc/.
An admitted student is defined as a resident or nonresident undergraduate, post baccalaureate, or graduate student enrolled for 1 or more credit and currently admitted to the University. Admitted students will be assessed tuition and fees based on enrollment status. Admitted students are entitled entry to PSU home athletic events (with the exception of playoff games and social events), and useof University resources, including the Library, Centerfor Student Health and Counseling (SHAC), and Student Recreation Center. Students taking 5 or more credits will be billed a health service fee as part of their tuition and fees. No reduction in the total charge is made to those students who do not intend to use specific res ources or services. Student taking 5 or more credits are also entitled to Student Health Insurance at an additional cost. More information can be found at pdx.edu/healthcounseling/insurance.
All non-admitted part-time students, taking 1 to 8 credits, pay tuition and fees according to the level of the course(s) in which they enroll. Courses numbered 499 or below are as sessed at the undergraduate rate; courses numbered 500 and above are assessed at the graduate rate. Part-time students enrolled in 4 or less hours are notentitled to health services or insurance. Residency and admis sion requirements are waived for students in this category. Visit pdx.edu/regis tration/enrollment-status for more information.

## Tuition and fee schedules/Regular tuition schedule

All students registered for coursework on or after the first day of the termhave a financial obligation to the University. For more, information please see the Terms \& Conditions of Payment at pdx.edu/student-
financial/sites/www.pdx.edu.studentfinancial/files/Terms \% 26ConditionsofPayment.pdf.
Students should consult the tuition and fee listing at pdx.edu/student-financial/tuition-and-fees for up-to-date information and applicable tuition and fees. Students who enroll are financially responsible for all clas ses and credits in which they are registered on or after the first day of the term. All classes dropped are subject to the refund schedule as outlined at pdx.edu/student-financial/refunds.

Account statements are available monthly in electronic format to currently enrolled student with a balance due. Notices are emailed to pdx.edu email addres ses on the 16th of every month. All tuition and fees may be paid online, by mail, or at Cashier's Office located in Student Financial Services. Specific deadlines are available at pdx.edu/student-financial/the-psu-payment-plan.
Tuition and fees must be paid in full each term. At the start of each term, students must pay the balance in full or optin to the PSU Payment Plan by the first payment due date. After the due date, students with a balance will be enrolled in the Payment Plan and incur a late fee. Additional information is available at pdx.edu/student-fin ancial/the-psu-payment-plan. Students may access their individual financial account balances by log ging onto banweb.pdx.edu.

## Tuition and fee calculation (Admitted) - One credit or more

Admitted students taking one credit or more are as sessed tuition and fees according to their undergraduate/graduate and residency status. Thelevel of courses in which students enroll is immaterial.

## Restricted Differential Tuition and noncredit

Enrollment in these courses may notbe combined with regular PSU credit courses for fee calculations. Restricted Differential Tuition courses have fees that are assessed in addition to any other tuition paid to the University.

## Senior citizen fee schedule

Senior citizens are defined as persons age 65 or older who do not wish to earn course credit. Senior citizens who are Oregon residents are authorized to attend classes on a space-available basis without payment of tuition. Charges for special materials, if any, must be paid.

Incidental and Health Servicefee privileges are not provided and the University does not maintain any records of enrollment. The regis tration receipt may be used to obtain a PSU ID Card.

## Late fees

Late payment fees will be charged on all mis sed payments.

## Other special fees

Special fees and fines are subject to change. Up-to-date information on special fees and clarification of charges can be obtained from the Student Financial Services office, 503-725-3440 or by visiting pdx.edu/student-financial.

## Terms and Conditions

Terms and Conditions can be viewed at pdx.edu/student-financial/sites/www.pdx.edu.studentfinancial/files/Terms $\% 26$ ConditionsofPayment.pdf
In the event of withdrawal, any refunds due are applied to the outstanding balance, and any remaining balance due remains payable. Failure to pay in full may also result in denial of registration, graduation, andtranscripts as well as additional assessment for collection charges and attorney's fees.

## Health Insurance

The health insurancefee is non-refundable. For specific deadlines and questions, see www.pdx.edu/healthcounseling/insurance.

## Graduate Assistants

Graduate as sistants (GAs) are fully admitted graduate students appointed to as sistantships while working toward an advanced degree. Appointments must be for at least. 15 FTE per quarter. GAs are exempt from the payment of the instruction fee on the first 9 credit hours per quarter. (Employing department will provide a tuition credit.) All GAs must register for a minimum of 9 graduatecredits. Hours in excess of 9 per quarter are as sessed at the normal rate and may be paid at the discretion of the department. GAs are responsible for paying the Building, Health, Incidental, Rec Center and any course specific fees.

## Withdrawals and fee refunds

Complete withdrawalordropping of courses can bedone through banweb.pdx.edu or in pers on with the Office of the Regis trar. For tuition and fee impact, see refund schedule at www.pdx.edu/student-finance/refunds. Refund consideration is automatic; no special requestis necessary.
Refunds of special course fees must be approved by departments. Complete withdrawal ordropping coursework does not cancel a student's obligation to pay a studentloan, balance of account, or any other financial obligation owed the University. Students with such outstanding obligations will have any refund due them applied against the obligation.

## 1. Official withdrawals

Students receiving financialaid who need to completely withdraw from clas ses during a termshould officially withdraw (see the instructions in the Schedule of Classes). By using the official withdrawal procedures, students will have tuition refunds calculated by the Student Accounts Department. Regardless of "official withdraw" orFinancial Aid, StudentFinancialServices will still calculate any possible refunds.
Students receiving financialaid who completely withdraw up to the 60 percent point of a term, will be identified. Financial aid staff will use the federal Return of Title IV Funds formula to calculate the percentage of financial aid earned versus the percentage of aid that mustbe retumed to federal aid programaccounts. In some cases, the Return of Title IV Funds calculation may take all of a student's tuition refund to repay federal aid accounts. In addition, students may be responsible for repayment of federal financial aid programfunds. Funds are returned to the financial aid programs from which they were awarded, starting with the loan programs.
Students who are considering withdrawing from a term should contact staff in the Office of the Regis trar.

## 2. Unofficial withdrawals

Students who stop attending without officially withdrawing fromPortland State University are considered to have unofficially withdrawn. Students who unofficially withdraw may receive all X or M grades at the end of a term. A grade of X is defined as no basis for grade or nonattendance. A grade of M designates a mis sing grade.
Students who receive financial aid fora term and unofficially withdraw are identified at the end of each term. Each studentreceiving financial aid who has unofficially withdrawn must provide proof of attendance for the term(s). Students who provide proof of attendance may be subject to the Return of Title IV Funds policy. Students who fail to provide proof of attendance will have all financial aid received repaid to federal accounts (including PLUS loans) and a university accounts receivable will be established.
Refund calculations are based on total tuition and fees. Special fees are nonrefundable. Refunds are computed from the date of official withdrawal or drop; they are not based on when attendance in class ceased. Students who are delayed in withdrawal process for reas ons beyond their control may petition for an earlier drop date via a Deadline Appeals petition obtained through the Office of the Registrar. Refund consideration is automatic; no special request is necessary. Action to process a refund cannot begin until after the end of the fourth week of the term.

## FINANCIAL AID AND SCHOLARSHIPS

503-725-3461<br>askfa@pdx.edu<br>www.pdx.edu/student-finance

The staff in the Office of Student Financial Aid and Scholarships is ready to help students understand the financial aid application process and the details of the funds they have been awarded.

## Eligibility

To determine students' eligibility for assistance, the following estimated direct and indirect expenses are used to create the students' Cost of Attendance: tuition and fees, books and supplies, housing and meals, tran sportation and personal/miscellaneous expenses. Because the Cost of Attendance uses average amounts, it may not reflect students' actual costs.

The Office of Student Financial Aid and Scholarships provides eligible students with financial aid in the form of grants and scholarships, employment and loans. Underlying the awarding of financial aid at PSU is the nationally accepted philosophy that parents are the primary source responsible for helping their dependent students meet their educational costs. The amount of the contribution expected fromparents is based on a family's financial strength as indicated by taxed and untaxed income, household size, number in college, and assets. Both dependent and independent students have a responsibility to make a reas onable contribution toward their costs fromearnings and savings. Financial aid resources serve to supplement these primary resources and are intended for educational expenses only. Financial aid eligibility is calculated using a formula determined by federal law.

Students should apply annually using the Free Application for FederalStudent Aid (FAFSA). The FAFSA can be filed online at www.fafs a.gov. PSU's federal school code to be used on the FAFSA is 003216 .

## Applications for Aid

Applications for financial aid must be submitted annually for the academic year and/or summer aid. The academic year at Portland State University begins with fall term and ends after summer term. While the Office of Student Financial Aid and Scholarships accepts FAFSA data at any time during the year, priority is given to admitted applicants who submit theirFAFSA as soon as possible
after October 1st, and who provide all requested information promptly. It is recommended that students apply no later than February 1steach year. It is not neces sary to wait for formal admis sion to the University before submitting the financial aid application. Scholarship applications are only accepted within the scholarship application open and close dates.
In order to be eligible to receive federal, state or institutional financial aid, students must remain in good academic standing as defined in the University Scholastic Standards Policy and by the Satisfactory Academic Progress (SAP) Policy requirements described at the end of the Fin ancial Aid section. The student must be officially admitted to an aid-eligible degree or certificate program, and must be a U.S. citizen or eligible non-citizen as defined by federal regulations. Students may not receive aid beyond es tablished limits, which include a rate of course completion, a maximum time frame, as well as annual and aggregate dollar amounts. Information about each aid programis available at www.pdx.edu/student-finance/types-aid.

## Undergraduate students

Eligible undergraduate students may receive consideration for financial as sistance through the Federal Pell Grant, Federal Supplemental Educational Opportunity Grant (SEOG), Federal TEACH Grant, Federal Work-Study, and Federal Direct Loan programs. Oregon resident students may also be eligible for the Oregon Opportunity Grant. Eligible parents of dependent students may borrow a Federal Direct PLUS Loan through the Federal Direct Loan Program, described in the Educational Loans section.

## Post-baccalaureate students

Eligible post-baccalaureate students may receive consideration for financial as sis tance through the Federal Direct Loan Program. Parents of dependent postbaccalaureate students may borrow a Federal Direct PLUS Loan through theFederal Direct Loan Program, described in the EducationalLoans section.

## Graduate students

Eligible graduate students may receive consideration for fin ancial as sistance through the Federal TEACH Grant, and Federal Direct Loan Program, which includes Federal Direct Unsubsidized Loans and Federal Direct Graduate PLUS Loans.

## International students

International students are not eligible to participate in federal financial aid programs butare eligible for certain scholarships offered through PSU.

## Award Notification

An Award Notification will indicate the types and amounts of financial aid from all sources for which the student is eligible, along with the terms and conditions of receiving and using the funds awarded. Award amounts will be displayed on the PSU studentaccount at www.banweb.pdx.edu. Students must review and accept the terms and conditions for specific awards if necessary, then accept or decline aid in an offered status.

## Delivery of Aid

After the financial aid award is accepted and all requirements have been completed, available financial aid will be credited to the student account to pay tuition and other billed charges for enrolled students each term. Financial aid that exceeds billed charges is then delivered to the student by the Portland State University Student Financial Services Office according to the preference that the student has established with the
University. See www.pdx.edu/student-finance/financial-wellness-center for more information.
FederalW ork-Study is earned on a monthly basis and paychecks are is sued at theend of each month by the University's payroll office. Students may authorize direct deposit of their Federal W ork-Study earnings to their bank account. More information can be found at www.pdx.edu/student-finance/financial-aid/apply.

## Aid Disbursement Policy

Financial aid can begin being dis bursed to a student's Portland State University revolving charge student account up to ten days prior to the start of each term. Aid will only disburse if a student's registered enrollment levelmatches their award enrollment level for the term, and there are no outstanding requirements. The ability to disburse aid prior to the beginning of a term means that the University must have a "census date" that is used to finalize a student's official aid eligibility for a term. Census dates for the 2022-2023 aid year and minimum enrollment requirements for the various financial aid programs can be found on the Office of Student Financial Aid and Scholarships website at www.pdx.edu/student-finance/eligibility. At the census date of each termeach student's enrollment is "locked" and considered to be final. Financial aid for that termmay then require adjustment based on their enrollment level at that time. When a reduction in aid is required due to a student's reduced enrollment level at the census date the reduction can create a balancedue on the student's PSU account. If there is tuition refund because of dropped credits, the tuition refund will be used to reduce the balance due on the student's account.

Students applying to borrow a federal student loan must be enrolled in a minimum of halftime credit hours, have
demonstrated need and/or eligible costs to receive a disbursement fromthe federal student loan programs.

Students who have received a dis bursement of a federal student loan and then reduce enrollment below half-time at any point will be required to complete federal student loan exit counseling. The PSU Registrar's Office will report the less than half time enrollment status to the federal student loan servicer which will result in the loss of In School Deferment status. All prior federal student loans for a borrower who does not qualify for in school deferment will enter the grace period or repayment if a grace period was previously used. Students who regain eligibility to borrow from the federal student loan programs by increasing enrollment after the census date for any termmust notify the Office of StudentFinancial Aid by submitting a Revision Request form to update their enrollment plan and request a reins tatement of their federal student loan.

Any current termaid disbursed after the census date will be based on the student's enrollment on the census date, or their actual number of credits enrolled at the time of disbursement, depending on type of aid. Credits added after the census date cannot be used to increase aid elig ibility. Retroactive aid (aid for a term that has ended prior to disbursement) must be disbursed based on completed grades/credit hours, or census date registration, whichever is less. This includes retroactive grants and loans. Grades that are considered "complete" for disbursement purposes are: A, B, C, D, F (if earned through course participation), $P, I$ or IP.

## Withdrawals-Official/Unofficial

Please see the annual Registration Guide, or vis it www.pdx.edu/registration, for the university policy regarding dropping classes and tuition refunds. Students who withdraw completely during the termand are receiving federal, state, or institutional financial aid may have a percentage of their aid reversed based on federal regulations and institutional policies. These students will have any unearned portion of their aid charged back to their PSU account, and may owe repayment directly to the U.S. Department of Education of any overpaid federal grants. Federal student aid recipients whobegin attending classes and then stop attending prior to the end of the quarter are considered by the federal government to have unofficially withdrawn. Forstudents who receive grades of X, M, NP, W orF in all of their classes, we must determine whether they unofficially withdrew. If Univers ity records indicate that student unofficially withdrew from the quarter, the University will consider theWithdrawal date to be the last date of attendance or participation in class by the student midpoint of the quarter as determined by the University. If University records show a federal student aid recipient never attended any class or performed any academically related activity for a quarter or term, then the recipient never established eligibility for any federal aid
funds that may have been disbursed for that quarter or term. The student mustrepay the entire amount of ineligible aid disbursed for that term. Any student aid recipient who drops all classes or voids their schedule with an effective date prior to the first day of class for a quarter or term did not establish eligibility for any funds that may have been disbursed for that quarter or term. More information can be found at www.pdx.edu/studentfinance/eligibility.

## Award Sources

Comprehensive details on the federal aid programs are available online at www.studentaid.gov. Students and families can also find FinancialAid consumer information and guides at www.pdx.edu/student-finance.

## Educational Grants

## Federal Pell Grant

This federally funded grant programis designed to provide as sis tance to eligible undergraduate students. The federal government determines the amount of the grant with the University acting as the disbursing agent. Eligibility is determined by the Expected Family Contribution (EFC) that results fromthe student's FAFSA data. Students have a lifetime limit that is the equivalent of 6 years of full-time enrollment forFederal Pell Grant eligibility. Students apply for this grant by completing the FAFSA.

## Federal Supplemental Educational Opportunity Grant (SEOG)

This is a limited federally funded grant programavailable to FederalPell Grant recipients who have the lowest EFCs . Students apply for this grant by completing the FAFSA.

## Oregon Opportunity Grant

All Oregon resident undergraduate students applying for financial aid will be considered for the Oregon Opportunity Grant awarded by the State of Oregon's Office of Student Access and Completion (OSAC). A wards are based upon financialneed. Details about eligibility can be found at www.oregonstudentaid.gov. A wards are renewable for up to 12 terms provided satisfactory academic progress and financial need continue each academic year. Oregon students apply for this grant by completing the FAFSA, or, if not eligible to complete the FAFSA, the Oregon Student Aid Application (ORSAA). The ORSAA can be found at www.oregonstudentaid.gov.

## Federal Teacher Education Assistance for College and Higher Education (TEACH) Grant

This grant provides up to $\$ 4,000$ per year to graduate and undergraduate students whointend to teach full-time as a highly qualified teacher in high-need subject areas for at least four years at schools that serve students fromlowincome families. Graduate students may receive up to
\$8,000 for graduate study. Undergraduate students may receive up to $\$ 16,000$ for undergraduate study. Part-time students are eligible, but the maximum grant will be reduced. Students apply for this grant by completing the FAFSA.

Important Notice: If TEACH Grant recipients fail to complete the four-year teaching obligation, they must repay the grant with interest under the Federal Direct Loan program.

## Tuition Grants, Scholarships, and Remissions

A variety of school funded programs that provide tuition as sis tance to eligible students. Students apply for these institutional programs by completing the FAFSA. More information can be found at www.pdx.edu/student-finance/financial-aid/grants.

## Athletic Grants-In-Aid and Scholarships

A thletic grants-in-aid and scholarships are adminis tered by the institution's financial aid and athletic departments. Each head coach is res ponsible for selecting recipients based upon eligibility and athletic ability. The National Collegiate Athletic Association(NCAA) sets forth the eligibility and financial aid requirements for Portland State University athletic teams. Any prospective PSU student should contact the coach of the desired sport about the availability of scholarships and the recruiting process. Each coach will then consider the prospectivestudent's athletic ability, eligibility, finances available, and the need of that particular sport. An athletic grant-in-aid request is then submitted to the director of Athletics for award to the prospective student.

## Educational Loans

## Federal Direct Loan Program

Portland State University participates in the Federal Direct Loan program. Under this program, funding for student loans comes fromthe U.S. Treasury and are dis bursed by schools. When loan repayments are due, borrowers repay themdirectly to the federal government through a loan servicer assigned by the U.S. Department of Education. Any subsequent loans are then serviced by the assigned loan servicer. Undergraduate and post-baccalaureate students can borrow Federal Direct Subsidized and Unsubsidized Loans; graduate students can borrow Federal Direct Unsubsidized Loans and Federal Direct Graduate PLUS Loans; and parents of dependentstudents can borrow Federal Direct Parent PLUS Loans.
Federal Direct Loan applicants must submit a FAFSA to have their loan elig ibility determined. After their loans have been awarded, they must accept themas part of their financial aid award acceptance process, and complete Master Promis sory Note and satisfy entrance counseling requirements at www.studentaid.gov.
Federal Direct Subsidized Stafford Loan

Subsidized loan eligibility is basedupon the demonstration of financial need and in conjunction with other sources of student as sistance. The federal government pays the interest on this loan while the student is enrolled at least half-time and during thesix-month graceperiod directly after a student separates fromschool. For students who are new borrowers after July 1, 2013, interest is paid by the federal government up to 150 percent of the published length of the academic program. The student is responsible for all interest on the loan once repayment begins or after 150 percent of the published length of the academic programis exceeded.
The federal governmenthas set annual borrowing limits of \$3,500 for the first academic year of undergraduate study (up to 44 credits); $\$ 4,500$ for the second academic year (45-89 credits); and \$5,500 an academic year for the remaining years of undergraduate study. Not all students are eligible for the maximum loan amount.
Student borrowers must beenrolled in good standing at least half-time and have been accepted for admis sion to a programleading to a degree or eligible certificate. Once repayment begins, borrowers are charged the interest rates that were in effect for each year they borrowed. For current interest rates, visit the Department of Education's website at www.studentaid.gov/understand-aid/types/loans/interestrates.
Students must complete a FAFSA each year to participate in this loan program.

## Federal Direct Unsubsidized Stafford Loan

This programprovides unsubsidized Federal Direct Loans to undergraduate and graduate students who do not demonstrate federally defined need. Unsubsidized loans are not eligible for the federal government payment of interest while the student is in school. The student may make interest-only payments while in school, or the interest will be added to the loan balance upon entering repayment. The interest rates for the Federal Direct Unsubsidized Loan are specific to each year that the student borrows. For current interestrates, visit theU.S. Department of Education's website at hwww.studentaid.gov/unders tand-aid/types/loans/interestrates. Students are responsible for the interest that accrues while in school, during their six-month grace period, and during any authorized deferment periods. The federal government has set annual borrowing limits of $\$ 2,000-$ \$5,500 for the first academic year of undergraduate study (up to 44 credits); $\$ 2,000-\$ 6,500$ for the second academic year (45-89 credits); and \$2,000-\$7,500 an academic year for the remaining years of undergraduate study. Undergraduate borrowing limits vary based on the borrower's dependency status as indicated by the FAFSA. Graduate students may borrow up to $\$ 20,500$ per year.
Lifetime (aggregate) Federal Direct Loan Borrowing Limits by Academic Program

A student may borrow up to an aggreg ate limit of \$31,000 (only $\$ 23,000$ may be subsidized) as a dependent undergraduate or post baccalaureate student; $\$ 57,500$ as an independent undergraduate or post baccalaureate student (only $\$ 23,000$ of this amount may be subsidized); and $\$ 138,500$ as a graduate or professional student (only $\$ 65,500$ of this may be subsidized). The ag gregate amount for graduate students includes all previous loans borrowed as an undergraduate or post baccalaureate student.

## Additional Federal Direct Unsubsidized Stafford Loan

Dependentundergraduate students whose parents' Federal Direct Parent PLUS Loan applications are denied may be eligible for additionalFederal Direct Unsubsidized Loan. Students who have earned fewer than 90 credits may borrow up to $\$ 4,000$ a year in additionalfunds above the maximum Federal Direct Loan annual limits (but may not exceed aggregate limits). Students who have earned 90 credits or more may borrow up to an additional $\$ 5,000$ per year (but may not exceed aggregate limits). Not all applicants will qualify for the maximums in additional funding. The Federal Direct Unsubsidized Loan may be used to replace the Expected Family Contribution, but total Federal Direct Loan (subsidized and unsubsidized) borrowing, plus other financial assistance received, cannot exceed the Cost of Attendance.

Students must complete a FAFSA each year to participate in this loan program.

## Federal Direct Parent PLUS Loan (PLUS)

This programprovides loans to parents of dependent undergraduate students. Parents may borrow up to an annual amount that is equal to the Cost of Attendance minus any financial as sistance the student receives during the periods of enrollment. The parent borrower may use the amount of the Federal Direct PLUS to replace the Expected Family Contribution and cover unmet need for the loan period. The Federal Direct PLUS Loan is limited to parents who do nothave adversecredit history or who have obtained an endorser who does not have adverse credit history. A servicer, contracted by the federal government, performs the required credit check. The interest on the Federal Direct PLUS Loan is fixed. For current interestrates, vis it the U.S. Department of Education's website at www.studentaid.gov/understand-aid/types/loans/interest-rates.
Parents interested in participating in the Federal Direct PLUS Loan programcan apply online at www.studentaid.gov.

Students must complete a FAFSA each year for their parent to participate in this loan program.

## Federal PLUS Loan for Graduate and Professional Students (Graduate PLUS)

This programis available to credit-qualified graduate students with or without financial need. Repayment begins within sixty days after the Federal Direct Graduate PLUS Loan is fully disbursed. Students who meet deferment requirements may obtain an in-school deferment fromthe U.S. Department of Education. Interest is fixed for each loan, and begins to accrue at the time the first dis bursement is made. For current interest rates, visit the Department of Education's website at www.studentaid.gov/understand-aid/types/loans/interest-rates.
Students must complete a FAFSA each year to be eligible for FederalDirect Graduate PLUS Loans.

## Private Alternative Loans

Privately fundededucation loans are not basedon need, and no federalformula is applied to determine eligibility. The amount borrowed can not exceed the Cost of Attendance minus other financial aid, including other loans. Interestrates and repayment terms vary by lender, and should be carefully considered when making borrowing decisions. Privately funded education loans may be used to supplement the federal programs when the cost of attendance minus the maximum federal aid still leaves unmet need. Forinformation on alternativeloans, visit the PSU website at www.pdx.edu/student-finance/financialaid/apply.

## Loan Repayment

Repayment of FederalDirect Loans (subsidized and unsubsidized) begins after the grace period, which is six months after the student withdraws or graduates from school, or has been enrolled less than half-time. Repayment of FederalDirect PLUS Loans begins within sixty days of the last disbursement. There are no penalties for making payments while in school or during the grace period. Students or parents may make payments at any time directly to their loan servicer.

## Entrance and Exit Counseling

First-time Federal Direct Subsidized and Unsubsidized Loan and Federal Direct Graduate PLUS Loan borrowers must complete entrance counseling, which focuses on a borrower's rights and responsibilities and provides information about res ponsible borrowing. Shortly before graduating orenrolling in less than half time credit hours at Portland State University, borrowers must als ocomplete student loan exit counseling. Both entrance and exit counseling are completed online at www.studentaid.gov.

## Debt Management and Default Reduction

Portland State University is committed to helping students with sound financial planning and debt management. Information about loans, repayment options, and debt management strategies is available in the Office of Student Financial Aid and Scholarships at www.pdx.edu/studentfinance and through theFinancial Wellness Center in the StudentFinancial Services office at www.pdx.edu/student-finance/financial-wellness-center.

## Federal Work-Study

The Federal W ork-Study Programis a limited, need-based programavailable to eligible undergraduate students.
Employment opportunities are on-campus and off-campus. On-campus jobs are available with nearly every academic and adminis trative department. Off-campus jobs are available with government agencies and nonprofit groups; many are community service jobs that involve directly serving the community while providing a good work experience. The America Reads program, which tutors young children in public schools, is one of these programs. The Portland State University Career Center lists openings for on-campus and off-campus jobs at www.pdx.edu/careers. More information can be found at www.pdx.edu/student-finance.

## Scholarships

Portland State University has a number of scholarships which are administered by individual academic departments, the PSU General Scholars hip committee, or special committees developed for specific scholarships. Scholarships generally are awarded on the basis of academic achievement or promise, and financialneed. More information can be found at www.pdx.edu/studentfinance/scholarships.

## Satisfactory Academic Progress and Financial Aid

To be eligible for federal, state or institutional aid students must make satisfactory academic progress (SAP), as defined by federal regulations, toward completion of their programof study. Portland State University monitors the following: 1) student's course completion rate which is a percentage calculated by taking the number of PSU + transfercredits passed divided by PSU + transfer credits attempted but not passed, according to student level; 2) grade point average (GPA) for PSU + transfercourses, according to student level; and 3) maximum time frame for PSU courses + accepted transfercredits. The maximum time frame for undergraduate students is 270 attempted credits. The maximum time frame for post-baccalaureate students is 90 attempted credits. The maximum time frame
for graduate students is establis hed according to the student's degree or program.

Repeated coursework: students may only receive aid once for repeating a previously passed class; students may receive aid for multiple repeats of failed clas ses as long as they maintain compliance with satisfactory academic progress requirements.

Multiple withdraws: financial aid recipients who withdraw from all of their classes, or who receive all non-passing grades in their classes TWICE within the school year, will have their financial aid eligibility suspended.

Graduate students must take courses at the appropriate level; at least $67 \%$ of all credits enrolled in during each academic year must be graduate levelcourses.

Students who do not meet all requirements of the satisfactory academic progress policy during a term will be placed on Financial Aid Warning; students who do not meet all requirements of the satis factory academic progress policy during a second term will have their eligibility for financial aid suspended. Students whose eligibility is suspended may submit a written appeal. Students who appeal successfully will be placed on Financial Aid Probation and may need to submit and follow an academic plan.

For more information on Portland State University's SAP Policy, visit www.pdx.edu/student-finance/satisfactory-academic-progress.

## UNDERGRADUATE STUDIES

Shelly Chabon<br>Vice Provost for Academic Personnel andDean of<br>Interdisciplinary General Education<br>650 Market Center Building<br>503-725-2262<br>www.pdx.edu/academic-affairs/

## Undergraduate Programs

Portland State University is committed to providing its students with maximum opportunities for intellectual and creative development within the context of its urban and international mission. Students earning a baccalaureate degree will complete a rigorous programof study leading to mastery of the chosen field of study at the undergraduate level. In addition, Portland State University is committed to providing the foundation for continued learning after completing the baccalaureate degree. This foundation includes the capacity to engage in inquiry and critical thinking, to use various forms of communication for learning and expres sion, to gain an awareness of the broader human experience and its environment (local, national, and international), along with an ability to appreciate the responsibilities of individuals to themselves, each other, and community.
Undergraduate students at Portland State University may work toward a Bachelor of Arts, a Bachelor of Science, a Bachelor of Fine Arts, or a Bachelor of Music degree with one or more majors. See Programs of Study (p. Error!
Bookmark not defined.) for majors leading to a baccalaureate degree.
Students working toward a bachelor's degree must complete the (1) University requirements, (2) University Studies (general education) requirement, (3) University Writing Requirement, (4) Race \& Ethnic Studies Requirement (RESR) (5) Bachelor of Arts, Bachelorof Fine Arts, Bachelorof Music, or Bachelor of Science requirements, (6) requirements for a major, and (7) Foreign Language competency if admitted with a high school foreign language deficiency. Students majoring in Liberal Studies or completing the Urban Honors Programdo not need to meet the University Studies generaleducation requirement. Specific requirements for a baccalaureate degree are detailed in the undergraduate degree and credentialrequirements section (p.31). Students pursuing supplementary programs mustcomplete additional requirements as specified in the curricula of these programs.
Students working toward a bachelor's degree may wish to supplement their major coursework with:
A certificate program which is an approvedacademic award given in conjunction with the satisfactory
completion of a program of instruction, signifying a standard of knowledge in a specific subject. Certificate types vary, with some available as part of a baccalaureate degree program, others available in non-degree status, and others available to post-baccalaureate students.
A minor is an optional, undergraduate credential, comprised of a formally defined set of courses in a declared secondary subject area/field of study, dis tinct from and outside of the degree major.
Fora list of available certificates and minors, see Programs of Study (p. Error! Bookmark not defined.).

## Intensive English Language Program

www.pdx.e du/english-language-programs
Uni versity Center Building, Suite 400
Phone: 503-725-4088 (Voice message only)
503-725-2437 (Voice/SMS text)
es1@pdx.edu

## Director: Kellie Gallagher (Interim)

Mailing Address:
Intensive EnglishLanguage Program
Portland State University
PO Box 751
Portland, OR 97207-0751
Street Address:
Intensive EnglishLanguage Program
527 SW Hall Street
University Center Building, Suite 400
Portland, OR 97201

## PROGRAM INFORMATION

The Intensive English Language Program(IELP) offers courses designed to develop students' competence in listening, speaking, reading, and writing. The IELP offers a wide variety of courses to help students meet theirgoals. The IELP Intensive Programis offered throughout the regular academic year and summer. There are two program options:(1) for students that desire academic preparation for undergraduate studies and (2) for students that desire academic preparation for graduate studies.
(1) Academic Preparation for Undergraduate Study In this program there are sixlevels from Level 0 (PreEntry) for low beginners to Level 5 for adv anced students. New students musttake the IELP placement exams given by the programthe week prior to the new term. Students placed in Level0 (Pre-Entry) must successfully pass that levelbefore taking courses in Levels 1-5. Full-time students in the Level 0 regis ter for 22 credits perterm. Full-time students in Levels 1-5 register for 18-20 credits
perterm. For more information on the Intensive Program, see our IELP website:http://www.pdx.edu/esl/programoptions.
(2) Academic Preparation for Graduate Study - This programhas one level. Students who planto enter the Graduate Preparation Programmust completeLevel4 and Level 5 in the Academic Preparation for Undergraduate Study Program with passing grades before entering the Academic Preparation for Graduate Study Program. For students who are in both levels 4 and 5, movement to one or more graduate preparation track courses may take place before all level 5 classes are completed, based upon review of the students' overall academic record.

## Accelerated Entry to Academic Preparation Program for Graduate Study

Students planning to pursue graduate study and planning to enroll in Academic Preparation for GraduateStudy (AP-G) courses may request to move fromlevel 4 directly into APG courses if they meet the following requirements:

- Complete EACH level4 class with a 3.0 GPA in each class
- Earn an overall 3.0 GPA in the program(cumulative IELP GPA). Students who wish to enter the accelerated graduate track option must meet with their IELP academic advis or to determine their eligibility.
- Students who elect to enter the Accelerated Graduate Track retain the option to take level 5 classes in the Academic Preparation for Undergraduate Study Programat the same time or upon completion of the Graduate Track clas ses.


## ADMISSION REQUIREMENTS

No IELP application is required for students admitted to Portland State University. New PSU students should contact the IELP about placement and registration prior to the start of the term. Non-PSU students who wish to enroll in the IELP may apply directly to the IELP by submitting an application formand supporting documents to ielpadm@pdx.edu. All new students must takea placement test in English adminis tered by the IELP. Placement into courses will be based on these testresults as well as on other standardized test scores if available.
Students admitted to PSU without an ESL restriction may elect to take Academic Preparation courses in Levels 4 and 5. Up to 24 credits in the Academic Preparation programs may be applied towards an undergraduate degree.
For information and application materials, contact the IELP: http://www.pdx.edu/esl/contact

## Interdisciplinary Minors

Portland State University offers numerous disciplinary minors in almost every department. In addition, PSU offers several interdisciplinary minors that explore topics or
professional areas that are better understood through multiple disciplines. The minors listed below in volve three or more departments in developing a curriculumto engage students in an interdisciplinary area.

Advertising Management Minor for Communication Studies Majors (p. 119)

Business Minor in Advertising for Graphic Design Majors (p. 119)

Classical Studies (p. 346)
Climate Change Science and Adaptation (p. 263)
Elementary Education (p. 323)
Elementary Education Science (p. 323)
History and Philosophy of Science (p. 279)
Law and LegalStudies (p. 430)
(p. 430)Medieval and Early Modern Studies (p. 280)

Neuroscience (p. 221)
Secondary Education (p. 324)
SpecialEducation (p. 325)
Sustainability
(p. 254)

Sustainable Urban Development (p. 417)
Systems (p. 339)

## Military Science

UTS room 204
2121 SW 4th Ave
503-725-3512
https://www.pdx.edu/rote/
The department of military science entails the study of techniques, psychology, and practice used with the training of officers and soldiers. Military Scienceencompasses six major branches as follows:
Military Organizations - Develops optimal methods for the administration and organization of military units, as well as the military as a whole.
Military Education and Training - Studies the methodology and practices involved in training soldiers, NCOs (non-commis sioned officers, i.e. sergeants), and officers.

Military History - Military activity has been a constant process over thousands of years, and the essentialtactics,
strategy, and goals of military operations have been unchanging throughouthis tory.
Military Geography - Military geography encompasses much more than protestation to take the high ground, it studies the obvious, the geography of theatres, also the additional characteristics of politics, economics, and other natural features of locations.
Military Technology and Equipment - Military technology is not just the study of various technologies and applicable physical sciences used to increase military power. It may also extend to the study of production methods of military equipment, and ways to improve performance and reduce material and/or technological requirements for its production.
Military Strategy and Doctrine - Military strategy is in many ways the centerpiece of military science. It studies the specifics of combat, and attempts to reduce the many factors to a set of principles that govern all interactions of the field of battle. PortlandState University and the Oregon Army National Guard offer a unique leadership development programs pecifically for the civilian career-minded student. This program, Guard Officer Leadership Developmentor GOLD/ROTC provides motivated young men and women with exciting and valuable instruction in a variety of areas such as decision-making, goal-setting, team-building, and smallgroup leadership. Clas sroomand outdoor activities are designed to physically, mentally, and emotionally challenge you, build your self-confidence, and develop your leadership skills. If you qualify, you could earn a commis sion as an Army officerupon graduation in the Oregon Army National Guard.

## Program

GOLD/ROTC is a four-year programthat provides oncampus military science instruction in two parts: the Basic Course and the Advanced Course. For this training, you are paid as a Sergeant (E-5). Both Courses are fully accredited and applicable towards fulfilling academic requirements for a baccalaureate degree.
Basic Course
The Basic Course is comprised of 100 and 200 -level lower divis ion courses, is usually taken in your freshman and sophomore years, and is open to any student enrolled at PSU. Your participation in this course is completely voluntary and requires no military commitment. Instruction is oriented on adventurous outdoor activities that give you insight in to the military service, basic soldiering, and leadership.

You also get to learn about the citizen-soldier and his or hersocial contributions, duties, and responsibilities. Through your personal in volvement, you get to see whetherthis role appeals to you.

## Advanced Course

The Advanced Course is a two-year pre-commissioning phase thatintegrates classroominstruction, military training, and practical experience to progressively develop your leader skills, qualities, and character. Further leadership development will occur in 300/400 level Military Science and Army Physical Fitness classes. We will continuously as sess your performance and provide you the es sential feedback and reinforcement you need to become a leader in business, the community, and the Army National Guard.
Eigibility For The Basic Course. This course is open to any student enrolled at PSU.
Eigibility For The Advanced Course. You must meet these requirements to be accepted into the Advanced Course:

- Be between 18 and 30 years old. Age wavier may be granted up to age 35 by the Adjutant General or Commanding General of the State or Territory you reside in. (NGB-ARH Memo \#06-11)
- Be a U.S. citizen.
- Be a member of the Army National Guard, Army Reserves or completedMS 100/200 level classes or attended LTC (Leadership Training Course) during the summer of your sophomore year.
- Be in good health as evidence by a current Chapter II or DODMERB physical.
- Be of good moral character and behavior.
- If you are currently in the Army National Guard or Reserves you do not have to participate in the Bas ic Course to enter the Advanced Course, butit is encouraged.


## Assessment

Portland State University as sesses undergraduate student learning and engagement related to the eight UndergraduateCampus-Wide Learning Outcomes: Communication; Creative and Critical Thinking; Disciplinary and/or Professional Expertise; Diversity; Engagement; Ethics and Social Responsibility; Internationalization; and Sustainability through a variety of activities.
Assessment of student learning andengagement occurs at classroom, departmental and institutionallevels. Your participation in as sessment matters, as results are used to improve teaching and learning, programstructure, course content, and the overall student experience at Portland State University.
The types of as sessments students might engage include standardized tests, placementtests, surveys, course evaluations, portfolios of student work, group or individual
interviews, or clas sroomresearch, to name a few. Incoming students to PSU may be required to take a writing assessment and, based on the results of that as sessment, take an assigned writing course.

## Academic standing policy

## Undergraduate, Postbaccalaureate and NonDegree Seeking Students

The faculty Scholastic Standards Committee (SSC) has the authority to place on Academic W arning, Probation or Dis missal any student according to the following standards:

## Academic Warning

Any student with 12 or more attempted credits (including PSU and transfer work) whose cumulative PSU GPA falls below 2.00 will be placed on academic warning. A regis tration hold will also be applied to the student record until completion of a mandatory intervention facilitated by advis ing and career services. Students on academic warning are restricted to registering for 13 or fewer credits perterm.

## Academic Probation

Students on academic warning will be placed on academic probation if they do not meet at least one of the following requirements:

1. Raise the cumulative PSU GPA to 2.00 , thereby returning to good standing or
2. Earn a GPA for the given termof 2.25 or above, thereby remaining on academic warning and subject to the same requirements in the next term.
Students on academic probation are restricted to registering for 13 or fewercredits perterm.

## Academic Dismissal

Students on academic probation will be dismissed if they do not meet at last one of the following requirements:

1. Raise the cumulative PSU GPA to 2.00 , thereby returning to good standing
or
2. Earn a GPA for the given termof 2.25 or above, thereby remaining on academic probation and subject to the same requirements for the next term.

## Notes

1. Grade changes or removal of Incomplete grades do not change academic standing status.
2. Academic standing status in the current termmay be changed by engaging the repeat policy, however
repreating courses will not retroactively change the status of a past term.
3. Students who are academically dismissed fromPSU are not permitted to register either full-time or part-time (including 1-8 credits)
4. When evaluating undergraduate academic standing, only PSU underg raduate credit is considered.
5. Students on academic warning or academic probation who receive only grades of I, X and/or NP will lose academic standing.

## Reinstatement

A student who is dismis sed may be reinstated in one of two ways. One is to petition and be approved for reinstatement by the Scholastic Standards Committee. Petitions for current termreinstatement must be returned to the Office of the Reg is trar prior to the beginning of the termfor a timely decision. Alternately, conferral of an accredited transferable Associate's or Bachelor's degree earned subsequent to the dismissal fromPSU, will constitute automatic reinstatement to the University. An official transcript with the degree posted must be presented to the Office of the Reg is trar. Reinstated students are given probationstatus.

## Graduate Students and Postbaccalaureates taking graduate level courses

Graduate Academic Standing is adminis tered by the The Graduate School. See the GraduateStudies section of this Bulletin ( p .42 ) for policy details.

## Credit for Prior Learning (CPL)

Portland State University recognizes that adults entering or returning to college bring with thema wide variety of prior learning experiences including work, travel, volunteering, activities in professional organizations, or self-study. CPL allows qualified undergraduate students to earn credit for college-level learning outside of the classroom.
PSU offers fourtypes of CPLcredit:

1. PSU Departmental Challenge Exam
2. Prior Learning Portfolio (The portfolio option is not available at this time)
3. College Level Examination Program(CLEP)
4. Military Credit

## CPL Academic Policies

1. StudentEligibility:
a. PSU Challenge Exam and Prior Learning Portfolio review requires students to be formally admitted to PSU as an undergraduate and to be enrolled in or
have completed one PSU course. Students enrolling in Prior Learning Portfolio must also be in Academic Good Standing.
b. CLEP and Military Credit is evaluated and awarded as transfer credit at the time a student is formally admitted to PSU, prior to matriculation/enrollment .
2. Grading: CPL credit is limited to Pass -only grading and, as such, will not have a GPA effect. A "No Pass" assessment is notrecorded on the PSU transcript and will have no impact on the GPA calculation.
3. Pass/NoPass Limit: PSU Exam and Portfolio credit are included in the calculation of the 45-hour limit on Pass credit. CLEP and Military Credit are exempt from the $45 \mathrm{P} / \mathrm{NP}$ limit.
4. Transcripts:
a. Credit earned by PSU Challenge Exam and Prior Learning Portfolio will be included and appear as ins titutional credit on the PSU official transcript. It will be identified as CPLcredit.
b. CLEP and Military Credit awards are notincluded on the PSU Official Transcript. CLEP and Military Credit awards are treated like transfercredit and may apply towards PSU degree requirements and appear on thePSU Degree Audit.
5. CPL Limits: No more than 45 credits of PSU Challenge Exam and Prior Learning Portfolio credit can apply toward a PSU degree. CPL can be used to complete degree requirements unless it is restricted in a major by a particular academic unit.
6. Repeat Policy: CPL is not eligible for the PSU Repeat Policy. Earning CPL credit for a course in which a studenthad previously earned a D or F does not remove the prior grade fromthe GPA calculation.
7. Residency Requirement: CPLcredit will not count toward the PSU credits in residence requirement.
8. University Studies Placement: CLEP and Military Credit will be combined with the transfercredit to es tablish placement into the University Studies general education program. PSU Exam and Portfolio credit will not be used toestablish placement.
9. CPL can be awarded in courses that have been approved by academic departments. Not all courses in all departments are open to challenge. Each academic unit decides which of its courses are available to undergraduates for CPL credit. No courses numbered 199, 299, 399, or 401 to 410 inclusive are eligible for CPL credit.
10. Credit earned by CPL may not be received in a course which:
a. Duplicates credit previously earned by a student, or
b. Is more elementary, as determined by departmental, college, or school regulations, th an a course in which the student has already received credit.
11. Department permis sion is required in order to reattempt CPL credit for the same course, after a nonpassing prior attempt.

## Undergraduate Degree and Credential Requirements

To earn a baccalaureate degree a student must complete (1) University requirements, (2) University Studies - General Education requirements, (3) University Writing Requirement, (4) Race \& Ethnic Studies Requirement, (5) specific requirements for the Bachelor of Arts, Bachelor of Fine Arts, Bachelor of Music, or Bachelor of Science Degree, (6) requirements for a major, and (7) Second Language competency if admitted with a High School Second Language Deficiency. Students earning a single major in Liberal Studies, or completing the Urban Honors programdo not need to meet the University Studies General Education requirements.

Students bear final responsibility for ensuring that the courses taken are applicable toward satisfying their degree requirements.

## 1. General University Requirements: GPA, Credits and Limitations

Minimum number of credits,
including lower-division plus upper-
division
(some programs require more than 180
credits)

Minimum number of upper-division
credits (300 and 400-level)

Minimum cumulative grade point
average
(2.00 on all PSU work and 2.00 on all courses no matter where taken in major
field of study. Some departments require GPA higher than 2.00 in major.)

Residence Credit: 45 of the final 75 , or 150 totalmust be taken at PSU. (Restrictions: PSUExam credit and Credit for Prior Learning portfolio
credit are excluded.
At least 25 of the last 45 credits must be for differentiated grades.)

Maximum number of credits
transferred fromregionally accredited two-year institutions

Maximum number of correspondence credits

Maximum number of credits graded $P$ (Pass) that may apply to a degree
(This does not include credits with Pass grades accepted in transfer from institutions that do not offer differentiated grades.)

Maximum number of Credit for Prior Learning credits that may apply to a degree

Maximum number of Physical Education activity credits that may apply to a degree

Maximum number of Cooperative Education credits that may apply to a degree

Maximum number of English as a Second Language (ESL) credits that may apply to a degree
(Note: to apply, courses must be at the advanced or academic college-level of study, which is defined as equivalent to PSU "level4" courses or above.)

## 2. University Studies (General Education Requirement)

This requirement does not apply to Liberal Studies majors or students formally admitted to the Urban Honors College. Urban Honors College general education requirements are satisfied with specific Honors courses.)

The purpose of the general education programat Portland State University is to enable students to acquire and develop the knowledge, abilities, and attitudes which form a foundation for lifelong learning. This foundation includes the capacity and the propensity to engage in inquiry and critical thinking, to use various forms of communication for learning and expression, to gain an awareness of the broader human experience and its environment, and to appreciate the responsibilities of persons to themselves, to each other, and to community.

To accomplish this purpose all freshmen entering with fewer than 30 prior university credits are required to complete the following program(See www.pdx.edu/unst/ for course descriptions and capstone offerings):

- Freshman Inquiry (15 credits). One year-long course which must be taken in sequence (UnSt 100-level).
- Sophomore Inquiry (8 credits). Students are required to choose two Sophomore Inquiry courses.
- Upper-Division Cluster (Junior and Senior Years) (12 credits). Students are required to select three courses (for a total of 12 credits) from one upperdivision cluster ( 300 to 400 -level courses designated with a U).
- Senior Capstone (6 credits). This 6-credit capstone course (UnSt 421) is the culminating generaleducation course for seniors. Students join an interdisciplinary team, develop a strategy to address a problemor concern in the community, and implement this strategy over one, two, or three quarters of work.

Note: Students may not use any course to satisfy both cluster andmajor requirements. Cluster courses must be taken outside of the major. This includes courses that might be cross-listed elsewhere with the student's major prefix.

## Attention transfer students:

The following placement within University Studies is based on total credits accepted at term of admission to PSU.

- Transferstudents whohave earned fewer than 30 quarter credits of transfer work are required to complete all of the Univers ity Studies program requirements, including the entire sequence of Freshman Inquiry.
- Transferstudents who have earned 30-89 quarter credits of transfer work are required to complete the University Studies programbeginning with Sophomore Inquiry as follows:30-74 credits, two courses; and 7589 credits, onecourse.
- Transferstudents whohave earned 90-134 quarter credits of transfer work are required to complete the

University Studies programbeginning with an UpperDivision Cluster.

- Transfer students whohave earned 135 or more credits of transfer work are required to complete the University Studies programbeginning with the Senior Capstone (6 credits).


## 3. University Writing Requirement - 2 collegelevel composition courses

Students must complete 2 college-level composition courses or their approved equivalents. The requirement may be satisfied in one of the following ways:

- Students admitted to PSU as freshmen (0-29 transfer credits) meet the requirement by completing the first two years of University Studies or Urban Honors College (both approved equivalents of composition courses);
- Students admitted to PSU having earned 30-89 transfer credits meet the requirement with Wr 121 (required for transfer admis sion) and the requisite number of Sophomore Inquiry courses determined by placement into University Studies or HON 201, 202, 203;
- Students admitted having earned 90 or more transfer credits have four options for meeting the requirement:
- Transfer into PSU with an approved equivalent of Wr 121 plus one approved composition course for which Wr 121 (or its approved equivalent) is a pre-requisite;
- Transfer into PSU with two approved composition courses for which Wr 121 (or its approved equivalent) is a pre-requisite;
- Complete Wr 121 plus an additional course from the following PSU course list: Wr 200, Wr 222, Wr 227, Wr 228, Wr300, Wr301, Wr323, Wr327, Wr333, Wr394, Wr 400, Wr 420 or a 4-credit Writing Intensive Course(WIC). Composition writing courses transferred into PSU may also be considered.
- Complete any two courses fromthe PSU list above.

For information about Writing IntensiveCourses or for questions about approved equivalents for composition courses, please email the English Department at eng@pdx.edu.

## 4. Race \& Ethnic Studies Requirement (RESR)

Students entering PSU with fewer than 90 college transfer credits will satisfy this requirement by completing two RESR des ignated courses (a minimum of 3 credits each) with a centralfocus on race, ethnicity and systemic oppression. One course must focus on the U.S. experience;
the second course mustcenter theexperiences of groups underEuropean and U.S. colonialis mand imperialism beyond the United States. One of the two courses taken must come from a course offered within the School of Gender, Race \& Nations (SGRN) or one that is cross-listed with an SGRN course. Students must select courses from the list below which identifies the list of acceptable U.S. focused courses, the list of European and U.S. Colonialism and Imperialism courses, as well as which courses come from or are cross-lis ted with SGRN departments. The courses which satisfy the SGRN component are identified with an asterisk before the course subject code.
Students entering PSU with 90 or more college credits will satisfy this requirement by completing one RESR
designated course (a minimum of 3 credits) with a central focus on race, ethnicity and systemic oppression.

## RESR Course Lists

U.S. focused course list:
*Bi 346U/WS 346U
*BSt 202, BSt 203, BSt 204, BSt 207, BSt 214, BSt 221, BSt 302U, BSt 304, BSt 316, BSt 318U, BSt 335U, BSt
342U, BSt 345U, BSt 351U, BSt 352U, BSt 378, BSt
384U
*ChLa 201, ChLa 301U, ChLa 302U, ChLa 303U,
*ChLa 325/Hst 325,
*ChLa 326U/Hst 326U
*ChLa 360, ChLa 471
CCJ 317
Eng 353U, Eng 369U,
*Eng 372U/WS 372U - Topics in Literature, Gender, and Sexuality: Lesbian \& Womxn Identities in Lit,
*Eng 372U/WS 372U - Topics in Literature, Gender, and Sexuality: Bodies, Power, and Places

ESM 487
FILM 384U - Topics in American Cinema and Culture: Anatomy of a Film: Daughters of the Dust,
FILM 399 Special Studies: Black Queer Cinema
Hst 324,
*Hst 325/ChLa 325,
*Hst 326U/ChLa 326U,
Hst 335U, Hst 442, Hst 446,
*Hst 471/ChLa 471
Ling 332U
*NAS 201, NAS 346, NAS 351
*NAS 399 Special Studies: Indigenous Literary and Cultural Studies,
*NAS 399 Special Studies: Introductionto Native American Cinema,

PS 335U
Soc 337U
*WS 305,
*WS 306U Global Gender Is sues:Picturing Contemporary Asian America,
*WS 306U Global Gender Issues:Intro to Asian American Studies,
*WS 307U, WS 330U, WS 332U,
*WS 346U/Bi 346U
*WS 372U/Eng 372U Topics in Literature, Gender, and Sexuality: Lesbian \& Womxn Identities in Lit,
*WS 372U/Eng 372U Topics in Literature, Gender, and Sexuality: Bodies, Power, and Places,
*WS 375U, WS 381, WS 451

## European and U.S. Colonialismand Imperialism course list:

*BSt 206, BSt 211, BSt 305U, BSt 306U, BSt 319U, BSt
325U, BSt 326U, BSt 353U, BSt 356U, BSt 357U, BSt 359U, BSt 363U,
*BSt 372U/Intl 372U- Post-Colonial Studies of Africa
*BSt 377U
*ChLa 341/Phl 341
CR 449
Eng 325U, Eng 420, Eng 422
FILM 370U Topics in Film, Media, and Culture: Cinema Against Empire,
FILM 487 Special Topics in International Film and the Moving Image: The Cinemas of Taiwan \& Hong Kong,
FILM 487 SpecialTopics in International Film and the Moving Image: Art Cinema in Is lamic Republic of Iran

HST 297 History through Film: Immigration and Belonging
Intl325U,
*Intl372U/BSt 372U - Post-Colonial Studies of Africa
Intl360U, Intl380U
*Ph1341/ChLa 341

PS 355U
SOC 444
SPAN 331
*WS 369U, WS 471

## *SGRN department list:

Black Studies (BSt)
Chicano/Latino Studies (ChLa)
Indigenous Nations Studies (NAS)
Women, Gender, and Sexuality Studies (WS)

## 5. Requirements for Bachelor of Arts, Bachelor of Fine Arts, Bachelor of Music, Bachelor of Science Degrees

Courses taken to satisfy BA/BS requirements may also be used to meet any otherrequirements if they conform to the regular qualification for those requirements.

- For the Bachelor of Arts degree: Students must complete a minimum of 23 credits to include a minimum of 10 credits in the arts and letters academic distribution area, with a minimum of 3 credits in the area of fine and performing arts; a minimum of 10 credits in the science and/or socialscience distribution areas, with a minimum of 3 credits in the science distribution area; and a minimum of 3 credits in a second language numbered 203 or higher (conducted in the target language). See second language requirements listed below.
- For the Bachelor of Fine Arts degree: Students must complete the specific programas prescribed by the department.
- For the Bachelor of Music degree: Students must complete the specific programas prescribed by the Department of Music.
- For the Bachelor of Science degree: Students must complete a minimum of 23 credits to include: oneyear of science courses (minimum 10 credits total) in the Science academic distribution area (excluding mathematical sciences/statistics), and two of the science courses ( 6 credits minimum) must contain integrated or as sociated laboratory or field work; a minimum of 10 credits in the Arts andLetters and/or the Social Sciences distribution areas; and minimum of 3 credits in mathematical sciences/statistics. Science courses may, but do not need to, be taken fromthe same science department. Unless otherwise specified, only courses within the Science dis tribution area that
have an explicit indication of lab or field work as part of the catalog description will satisfy the B.S. degree requirement for lab/field work.


## Academic Distribution Areas

- The Arts and Letters academic distribution area cons ists of undergraduate courses fromthe following: Applied Linguistics, Architecture, Art, Arts and Letters, Black Studies (BSt 221, BSt 351U, BSt 352U, BSt 353U, BSt 421, BSt 424U, BSt 425U, BSt 426U, BSt 427U only), Communication, Conflict Resolution, Dance, English, Film, Judaic Studies (JSt 325, JSt 431, JSt 435 only), Music, Philosophy, Speech and Hearing Sciences, Sy stems Science (SySc 421 only), Theater Arts, World Languages and Literatures, Writing.
- The Science academic dis tribution area consists of undergraduate courses from the following: Anthropology (Anth 101, Anth 102, Anth 350/350L, Anth 355, Anth 370/370L, Anth 372, Anth 373, Anth 376, Anth 379, Anth 452, Anth 453, Anth 454, Anth 455, Anth 471, Anth 472, Anth 473, Anth 477, Anth 478, Anth 479 only), Biology, Chemistry, Environmental Science and Management, Geography (Geog 210, Geog 310U, Geog 311U, Geog 312U, Geog 313 U , Geog 314U, Geog 320, Geog 322U, Geog 333U, Geog 340U, Geog 380U, Geog 407, Geog 413, Geog 414, Geog 415, Geog 418, Geog 420, Geog 440, Geog 475, Geog 476, Geog 477, Geog 480, Geog 481, Geog 482, Geog 484, Geog 485, Geog 488, Geog 489, Geog 490, Geog 492 - Geog 497 only), Geology, Mathematics/Statistics, Physics, Science, Systems Science (SySc 330, SySc 332, SySc 334, SySc 411, SySc 414, SySc 431, SySc 435, SySc 440, SySc 445, SySc 452 only).
- The Social Science academic distribution area consists of undergraduate courses from the following:
Anthropology (except Anth 101, Anth 102, Anth 350/350L, Anth 355, Anth 370/370L, Anth 372, Anth 373, Anth 376, Anth 379, Anth 452, Anth 453, Anth 454, Anth 455, Anth 471, Anth 472, Anth 473, Anth 477, Anth 478, Anth 479), Black Studies (except BSt 221, BSt 351U, BSt 352U, BSt 353U, BSt 421, BSt 424U, BSt 425U, BSt 426U, BSt 427U), Chicano/Latino Studies, Child and Family Studies, Criminology \& Criminal Justice, Economics, Geography (except Geog 210, Geog 310U, Geog 311U, Geog 312U, Geog 313U, Geog 314U, Geog 320, Geog 322U, Geog 333U, Geog 340U, Geog 380U, Geog 407, Geog 413, Geog 414, Geog 415, Geog 418, Geog 420, Geog 475, Geog 476, Geog 477, Geog 480, Geog 481, Geog 482, Geog 484, Geog 485, Geog 488, Geog 489,Geog 490, Geog 492 - Geog 497), History, International Studies, Judaic Studies (except JSt 325, JSt 431, JSt 435), Native American Studies, Political Science, Psychology, Social Science, Social Work (SW 310, SW 320, SW 340, SW 341, SW 350, SW 351, SW

375, SW 384, SW 399 Intro to Oppression \& Privilege , SW 416, SW 430, SW 431, SW 432, SW 450, SW 451 only), Sociology, Sy stems Science(SySc 336, SySc 338, SySc 340, SySc 342, SySc 350, SySc 413, Sy Sc 418 only), Urban Studies and Planning, Women's Studies.

## Fine \& Performing Arts Requirement

The Fine \& Performing Arts area consis ts of undergraduate courses fromthe following College of the Arts subject areas: Architecture, Art, Dance, Film, Music, Theater Arts. Courses fromother colleges that satisfy this requirement include: BST 353U, 356U, 363U, 425, 426, COMM 362, DANE 361U, ENG 305U, 334, 335U, 435, FR 105, 305, HST 497,,IT 361U, JPN 361U, MGRK 361, PHE 455, PS 317U, RSU 331U, SOC 454, SPAN 430 (Ibero-American Film), 436, USP 314U, WS 309, WR 416.

## 6. Major Requirements

Students must complete the requirements for at least one major field of study. Descriptions for major program requirements can be found in the individual department sections of this catalog.

## 7. High School Second Language Admission Deficiency

Students graduating fromhigh schoolin 1997 or later who did not meet the Second Language Proficiency requirement at the time of admis sion must complete the requirement prior to earning an undergraduate degree at Portland State University.
Second Language Proficiency Requirements (2 units) includes demonstrated proficiency equivalent to two years of the s ame high school-level second language. Students who did not meet this requirement in high school may demonstrate proficiency by meeting oneof the following options:

- Pass with a D- or better two quarters or two semesters of college-level second language
- Pass an approved proficiency exam
- American Sign Language qualifies as a second language.

For a complete list of proficiency options available for meeting the second language requirements, please contact the University's Office of Admissions.

## Catalog Eligibility and Degree Requirements

To earn an undergraduate degree, a student must meet the degree and majorrequirements published in an annualPSU Bulletin (catalog) for which the student is eligible and which is still valid at the time of the student's graduation.

This applies to a first bachelor's degree, subsequent bachelor's degrees and to certificates earned by undergraduate and postbaccaluareate students.

## Catalog eligibility rules

Students may select the requirements of the PSU catalog in effect during the year they first enrolled at any accredited, postsecondary institution, or any subsequent year, regardless of whether the student was enrolled or not, as long as the student graduates within seven years of the year selected.

## Seven-year rule

The requirements in any Bulletin (catalog) are valid for seven years. Specifically, a catalog is valid through the summer term following the seventh academic year after is suance of the catalog. Example: The 2022-23 catalog requirements will expire at the end of summer term 2029.

## Double Major

## Double Major

Students with two or more majors must identify which major is considered the primary/first major. The primary/first major will determine how the University Studies general education requirements are applied. Specifically, primary/first major courses cannot apply to University Studies clusters. (For this purpose, major courses include any course with a subject code that matches the major, plus any specific course required or used to meet major requirements, even if from another department.) Also, a few majors require an additional, specific Sophomore Inquiry course. If double majoring, the liberal studies major (which does not require University Studies general education requirements) cannot serve as the primary/first major. In this case the other major will be considered the primary/first major and the University Studies cluster restrictions will apply accordingly.

## Concurrent Degrees

Students may earn two degrees at the same time, as long as the degrees are different and the majors are different, by 1) meeting the requirements in the specific Bachelor's degree (e.g. BA, BS, BFA, BM) and in each major, 2) earning 36 credits beyond the 180 minimum required for a single Bachelor's degree (i.e. 216 credits total), and 3) meeting the PSU Residence Credit requirement by completing 45 of the last 75 or 150 of the total 216 at PSU.

## Minors

A Minor is an optional, undergraduate credential. It is a formal, defined set of courses in a declared secondary subject area/field of study, distinct fromand outside of the
student's degree major, in which knowledge is gained in a coherent pattern of courses. A minor is intended to supplement the major field of study, and as part of a baccalaureate degree programmay only be awarded at the same time the baccalaureate degree is awarded. A minor is posted to the official transcript, but does not print on the diploma.

## Undergra duate Certificates

## Undergra duate Certificates

A certificate is an approved academic award given in conjunction with the satisfactory completion of a program of instruction, signifying a standard of knowledge in a specific subject. Certificates are posted to the official transcript and documented on a separate diploma.

In addition to meeting the specific course requirements of the certificate, students must meet the Residency Requirement: a minimum of 16 credits or $3 / 4$ of the credits required for the certificate, whichever is higher, must be earned at Portland State University.

Three types of certificates are available at the undergraduate level, each differing in terms of the minimum required admis sion status and in the timing of when the certificate is awarded, as described below. Individual certificates may have unique pre-requis ites or programadmission requirements defined by the academic departments.

## Undergraduate Certificate Awarded with Baccalaureate

An Undergraduate Certificate Awarded with Baccalaureate is intended to supplement the major field of study and is an optional credential. Undergraduate Admis sion is required, and as part of a baccalaureate degree program, this typeof certificate may only be awarded at the same time the baccalaureate degree is awarded. This certificate type may also be earned by students admitted and matriculated into Postbaccalaureate and Graduate status.

## Undergraduate Certificate Awarded at Completion

An Undergraduate Certificate Awarded at Completion may supplement the major field of study or be awarded as an independent credential prior to completion of the bachelor's degree. This certificate type may also be eamed by students admitted and matriculated into Postbaccalaureate and Graduate status.

## Certificate - Admission Not Required

Formal undergraduate admis sion is notrequired. Students may earn the certificate in the non-degree enrollment status. Financial Aid is not available to students enrolled in the non-degree status. This certificate type may also be earned by students admitted and matriculated into Undergraduate, Pos tbaccalaureate or Graduate status.

## Postbaccalaureate Credential Requirements

## Second Baccalaureate Degree

A candidate for a second baccalaureate degree must complete the following:

1. Residencecredit after earning first degree: if the first degree was fromPortland State University, 36 credits; if the first degree was from another college or univers ity accredited by a recognized regional as sociation, 45 credits. Restriction: At least 25 of the 45 credits must be for differentiated grades (A-F).
2. Bachelor of Arts degree: if the first degree was not a B.A., students mustcomplete a minimum of 23 credits to include:
a. a minimum of 10 credits in arts and letters distribution area with minimum of 3 in fine and performing arts
b. a minimum of 10 credits in science and/or social science distribution area with minimum of 3 in science
c. a minimum of 3 credits in a second language numbered 203 or higher.
3. Bachelor of Music degree: if the first degree was not a B.M., students mustcomplete programin music and applied music as prescribed by the Department of Music
4. Bachelor of Science degree: if the first degree was not a B.S., students mustcomplete a minimum of 23 credits to include:
a. Minimum of 10 credits science including 6 with lab (excluding math/statistics)
b. Minimum of 10 credits arts and letters and/or social science
c. Minimum of 3 credits math/statistics
5. Bachelor of Fine Arts degree: if the first degree was not a B.F.A. students must complete programas prescribed by the department.
6. Requirements for a major: Courses taken as a postbaccalaureate student or as part of the first degree programcount toward the major. Students do not need to meet the general education requirement.
7. Admitted postbaccalaureate students must maintain a cumulative GPA of 2.00 on all work taken at PSU. Failure to do so will result in academic warning, probation, or dis mis sal.
8. Postbaccalaureate students who do nothold a degree from a university in the U.S., English-speaking Canada, Great Britain, Ireland, Australia, or New Zealand must satisfy the Wr323 requirements before graduation from PSU.

## Postbaccalaureate Certificates

Postbaccalaureate Certificates are approved academic awards given in conjunction with the satisfactory completion of a programof instruction, signifying a standard of knowledge in a specific subject.The curriculum is designed forstudents to complete after they have already earned a bachelor's degree. To be eligible to earn the certificate, the student mustbe admitted and matriculated into postbaccalaureate or graduatestatus. A Postbaccalaureate Certificate is posted to the official transcript and documented on a separate diploma.
In addition to meeting the specific course requirements of the certificate, students must:

- Hold a previously earned baccalaureate degree.
- Meet the Residency Requirement: a minimum of 16 credits or $3 / 4$ of the credits required for the certificate, whichever is higher, must be earned at Portland State University.
- Students who do not hold a degree froma university in the U.S., English-s peaking Canada, Great Britain, Ireland, Australia, or New Zealand must satisfy the Wr 323 requirement.


## Grading System for Undergraduates

The undergraduate grading systemapplies only to undergraduate courses.
The undergraduate grading systemgives students the choice of taking certain courses designated by departments for either differentiated (A, B, C, D, F) or undifferentiated (pass or no pass) grades.

The following grading scale is employed at the undergraduate level:

$$
\begin{array}{llllll}
\mathrm{A} & =4.00 & \mathrm{~B}- & =2.67 & \mathrm{D}+ & =1.33 \\
\mathrm{~A}- & =3.67 & \mathrm{C}+ & =2.33 & \mathrm{D} & =1.00 \\
\mathrm{~B}+ & =3.33 & \mathrm{C} & =2.00 & \mathrm{D}- & =0.67
\end{array}
$$

$$
\mathrm{B} \quad=3.00 \quad \text { C- } \quad=1.67 \quad \text { F }=0.00
$$

Evaluation of a student's performance is determined by the following grades:
A-Excellent
B-Good
C-Satisfactory
D-Inferior
F-Failure
P—Pass
NP—No pass
The following marks are also used:
I-Incomplete
IP-In Progress
W—Withdrawal
AU—Audit
X-Non-attendance and No basis for grade
M —Mis sing grade/No grade received

## Pass/No Pass Grading Options

The online Class Schedule identifies courses as offered under the differentiated or undifferentiated option. Students electing the undifferentiated grade option when it is offered are graded pass or no pass. In the majority of instances, a pass grade is equated to a C -grade orbetter, although some departments may differ. (NOTE: At the graduate course level the equivalent of a B- grade or better is required to earn a grade of P ). Pas s/NoPas s grades are not used in computing a student's GPA. A maximum of 45 credits graded P may be applied toward Portland State's baccalaureate degree. Students elect gradeoptions for specific courses during the registration period. Grading options may not be changed after the seventh week of the term. The undifferentiated grade option may not be used to repeat a course previously taken for differentiated grade or for major requirements in some departments.

## Incomplete Grades

Students do not have a right to receive/demand an Incomplete grade. The option of assigning an Incomplete grade is at the discretion of the instructor when the following criteria are met.

## Eligibility Criteria

1. Required satisfactory course completion/participation. The quality of the work is satis factory, but some es sential work remains. In addition, the student musthave successfully completed most of the course work at the time the student requests the Incomplete, with a minimum grade up to that point of a C- for undergraduate, or B-for a graduate level course.
2. Reas onable justification for request. Reasons for assigning the Incomplete must be acceptable by the instructor. A student does not have the right to demand an Incomplete. The circums tances should be unforeseen or be beyond the control of the student. The instructor is entitled to request appropriate medical or other documentation to validate the student's request.
3. Incomplete grade is not a substitute for a poor grade. The Incomplete grade is not meant to create the opportunity for special or additional work for a student to raise a poor grade, or for the opportunity to take the course over by sitting in on the course in a later term without registering or paying for it.
4. Written agreement. A written or electronic agreement will be endorsed by both the instructor and student. The document will specify a) the remaining work to be completed, b) the highest grade which may be awarded upon submis sion of remaining items, and c) the date which the missing work is due. The latter may not exceed one year fromthe end of the termfor enrollment for the given course. A template "Incomplete Contract" is available at www.pdx.edu/registration/grading-system.
5. Resolving the Incomplete. Instructors may not encouragestudents to "sit in" an entire future course in order to resolve the Incomplete grade. If the student needs to retake the entire course, they should be given the grade presently earned, and must formally register for the future class they will be attending. If the missed portion of the course is no longer available, instructors may offer an alternative assignment. Grading weight of the alternative as signment should notexceed the original as signment. Students are fully res ponsible for monitoring all due dates.

## Other Rules:

1. GPA Calculation: Incomplete grades are notincluded when calculating GPA.
2. Deadline for Completion: The deadline for completion of an Incomplete is one calendar year. The instructor may set a shorter deadline, which is binding. Any request for a longer deadline must be requested via petition to the Scholastic Standards Committee or Graduate Council.
3. Failure to make up an Incomplete by the end of one year:
a. Undergraduate Incomplete Grades: The mark of "I" will automatically change to a grade of "F" or "NP", depending on the grading option chosen by the student upon registration. If the Incomplete converts to an F , the F grade is included in calculating GPA.
b. Graduate Incomplete Grades: The Incomplete will become part of the permanent record for a graduate course.
4. Graduating Undergraduate Students: Incompletes awarded in undergraduate courses taken in Fall 2006 or later will automatically chan ge to a grade of "F" or "NP" before conferral of the degree. The faculty of record may submit a grade change no later than 30 days after the degree is awarded. Grades of "F" or"NP" will remain on the academic record after this period and cannotbe removed.

## Drops and withdrawals

The student must initiate drop/withdrawals froma course. It is the student's responsibility to withdraw properly by the deadline dates published online at www.pdx.edu/reg istration/calendar. To avoid having to pay special course deposit fees, students should referto departmental policies.

A student may drop with no record of the course on the transcript up to theend of the second week of the term. As a courtesy, students are advised to notify the ins tructor concerned of the intended drop.

A student may withdraw for any reason before theend of the seventh week. A student withdrawing in the third through the seventh week will have a "W" recorded on the transcript.

A student cannot withdraw after the seventh week without approval of the Deadline Appeals Committee. A "W" is recorded if the petition is allowed.
Deadline dates for drops and withdrawals are found in the academic calendar published online at
www.pdx.edu/registration/calendar.

## X Grade: Non-attendance and No Basis for Grade

The $X$ grade is used when there is little or no attendance and no work/performanceupon which to base an academic evaluation. $X$ grades cannot be changed after initial submission and other grades cannot bechanged to $X$ except in cases of bona fide grading error as documented by instructor, requiring department chair approval. X grades carry nocredit and are not included when calculating GPA.

## M Grade: Missing Grade

M grades are automatically assigned by the system when grades have not been submitted to the Office of Regis trar by the grading deadline. M grades will change to a grade of $X$, one termafter the initial term. Once converted to an X , grade cannot be changed except in cases of bona fide grading error as documented by ins tructor, requiring department chair approval. M grades carry no credit and are not included when calculating GPA.

## Non-Completion of Course

A student who has participated in a coursebut who has failed to complete es sential work or attend examinations, and who has not communicated with the instructor, will be as signed a $\mathrm{D}, \mathrm{F}, \mathrm{NP}$, or whatever grade the work has earned. Students who have not attended, nor participated in a course may receive an X grade.

## Grade Point Average (GPA)

The Office of the Regis trar computes current and cumulative GPAs on student grade reports and transcripts, according to the following scale: $\mathrm{A}=4, \mathrm{~B}=3, \mathrm{C}=2, \mathrm{D}=$ $1, \mathrm{~F}=0$. A plus grade increases the points by 0.33 , a minus decreases it by 0.33 (e.g., $\mathrm{B}-=2.67$ ). Cumulative grade point averages include all credits and points earned at PSU. The GPA calculation is truncated at two decimal points (i.e. rounding up is not used). Separate GPAs are calculated for undergraduate courses and for graduate courses. Further details on academic standing can be found at www.pdx.edu/registration/academic-standing.

## GPA Repeat Policy

This policy only applies to undergraduate duplicate courses. Credit and GPA are retained on the first A, A-, $\mathrm{B}+, \mathrm{B}, \mathrm{B}-, \mathrm{C}+, \mathrm{C}, \mathrm{C}-$, and all grades in subsequent attempts count in GPA. The first PSU grade of D or F may be forgiven if repeated at PSU for a differentiated grade (not $\mathrm{P} / \mathrm{NP}$ ). In this case, credit is retained on the lastgrade received. Both grades are retained on the transcript. If repeated more than once, each subsequent grade will be retained on the transcript and counted in the GPA. Credit for Prior Learning and Credit by Exam are not eligible for use in the Repeat Policy.

## Latin honors at graduation

Latin honors designations are conferred at the baccalaureate level to students who have earned the requisite PSU GPA and who have earned a minimum of 72 credits fromPSU, with at least 60 of thosecredits taken for differentiated grades (A-F). The GPA calculation is based on PSU credit and utilizes the current PSU repeat policy. The award levels are as follows:
summa cum laude-3.90-4.00
magna cumlaude-3.80-3.89
cum laude-3.67-3.79
Latin honors are noted on academic transcripts, ins cribed on diplomas, and honors candidates are identified in the commencement program.

## President's List and Dean's List Awards

Portland State University recognizes and honors the academic accomplishments of our undergraduate students each termby awarding placement on the Dean's List and
the President's List. High achieving students, as indicated by grade point averages, are placed on the Dean's or the President's List according to the criteria established by the Council of Deans. Dean's List and President's List awards are only given to undergraduate students who have not yet earned a baccalaureate degree. The awards are given at the end of each termand are not recalculated based on grade changes or the removal of incomplete grades. The award is acknowledged with a notation on thestudent's academic transcript.

## Full-time

Students who have a termGPA of 4.00 are placed on the President's List, and students who have a termGPA of 3.75-3.99 are placed on the Dean's List.

Students on both lists must be admitted undergraduate students with a cumulative GPA of 3.50 or better, carrying 12 credits or more (excluding AU and P/NP credits).

## Part-time

Admitted undergraduate students with a cumulative GPA of 3.50 or better, carrying fewer than 12 credits for a given term may qualify for the President's List (4.00 GPA) or Dean's List (3.75-3.99 GPA) if both of the following conditions are met:

- A minimum of three part-time terms must be completed in succession, without interruption by either a term of full-time enrollment or the awarding ofDean's List or President'sList
- At least 12 credits (excluding AU and P/NP credits) must be earned over the combined part-time terms and the student must have an average GPA of 4.00 (President's List) or 3.75-3.99 (Dean's List) overthe combined terms


## Transfer Credit Policies

## Accredited colleges and universities

The Office of the Registrar, in consultation with academic units evaluates credits fromaccredited colleges and universities. Portland State University accepts collegelevel credits earned in academic degree programs at colleges and universities accredited by regional accrediting as sociations and as recommended in Transfer Credit Practices of Designated Educational Institutions. All courses are evaluated to be either equivalent or parallel to PSU courses. Equivalent means that the catalog course description is substantially equal to that in the Portland State University Bulletin. Parallel means that the course is in a discipline which is offered by Portland State, even though PSU does not offer the specific course.

## Unaccredited institutions and foreign colleges and universities

Departmental representatives, working through the Office of the Registrar, are authorized to evaluate credits transferred fromunaccredited institutions or foreign colleges and universities after a student has been admitted to PSU. For specific course equivalency, students may be asked to provide catalog descriptions and/or documents certifying course content. W ork fromunaccredited schools is evaluated in accord ance with the institutions and policies listed in Transfer Credit Practices, published by the American Association of Collegiate Registrars and Admis sions Officers. Credit given for a particular course will not exceed credit given for the equivalent or corresponding PSU course.

## Co-admission programs

Portland State University has established co-admission programs with Chemeketa Community College, Clackamas Community College, Clark College, Clatsop Community College, Mt. Hood Community College, Oregon Coast Community College, and Portland Community College. Each co-admission programallows students to concurrently enroll at both PSU and the community college campus. For more information go to https://www.pdx.edu/admissions/co-admis sion.

## Associate degree transfer

Students who upon admis sion have completed an Associate of Arts-Oregon Transfer (AAOT) or an Associate of Science Oregon Transfer-Business (ASOT-B) or an As sociateof Science Oregon Transfer - Computer Science (ASOT-CS) degree at an accredited Oregon community college or another PSU-approved associate degree, havemet all lower-division general education requirements, which includes freshman and sophomore University Studies requirements. The student must still fulfill any outstanding upper-division general education requirements. The transfer Associates may not satisfy all requirements for admiss ion to professional schools. Please check with each school for specific admission requirements.

## Oregon Transfer Compass Programs <br> Core Transfer Map (CTM)

Transferstudents who present an earned CTM froman Oregon community college will be granted a minimum of 30 quartercredits applied toPSU general education requirements.

## Major Transfer Map (MTM)

MajorTransfer Maps (MTMs) are statewide agreements that create streamlined and guaranteed paths for students transferring froman Oregon community college to an

Oreg on university, based on the chosen major field. MTMs specify clear course-taking paths necessary for on-track progress towards a specific major/bachelor's degree. MTMs build on the 30-credit general education foundation defined by the generic Core Transfer Map (CTM), although MTMs may specify particular relevant/required General Education courses as part of the 30-credit CTM component of the MTM. The individual MTMs identify the optimal and specific set of community college courses students need to take to transfer efficiently into the major at the university.

The successful completion of an MTM programthat PSU participates in allows students to receivestatus at PSU, based on the number of academic credits referenced in the MTM agreement, including at least 30 credits of general education satisfied, that is comparable to the status of students with the same number of academic credits in the major course of study who began their postsecondary studies at PSU. The students will not be required to retake a course, as long as the minimum required grades have been earned. Students must have earned a cumulative grade point average of 2.0 and meet the residency requirements at the community college awarding the MTM.

When students complete an MTM, the generaleducation courses in the "Core Transfer Map" portion of the MTM, for which minimum required grades have been earned, are guaranteed to transfer into general education, degree, or major requirements for a bachelor's degree.
Students who want to transfer prior to completing the MTM should talk with their community college advisor and an advisor at PSU prior to transfer about how their courses will count to wards general education requirements and degree/major requirements. If the MTM is not awarded advisors can guide students to determine if they are eligible for a CTM. Students are res ponsible for informing the admis sions counselor or intake advisors at PSU that they are completing an MTM. It is important for students to understand that completing the MTM in two years and the bachelor's degree in fouryears requires them to completea minimum average of 15 credits per quarter (or 45 credits peryear).

## Oregon Transfer Module (OTM)

Transfer students who present an earned OTM from another Oregon institution will be granted a minimum of 45 quarter cred it hours toward their general education graduation requirements.

## Vocational and Career-Technical credits

Portland State University grants up to 12 credits for courses which are deemed vocational-career technical. These credits are transferred to PSU as general elective credits.

## Correspondence credit

A maximum of 60 correspondence credits are acceptable in transfer fromregionally accredited schools recognized as institutions of highereducation.

## Community and junior colleges

The number of lower-division credits to be accepted in transfer fromregionally accredited community and junior colleges is limited to 124 .

## College courses completed before high school graduation

College courses taken before a high s chool diploma is received are accepted in transfer provided the student receives grades of D - or above in the courses and the grades are posted on a college transcript.

## Health Science Professions

Students who have completed preprofessional programs at PSU may transfer up to 48 credits of their professional health science work from schools accredited by a regional as sociation and/or as indicated in Transfer Credit Practices. The health science students may not receive a bachelor's degree fromPSU and from the professional school when both degrees are based essentially on the same credits completed by the student. The residence credit requirement is satisfied by completing 45 of the last 60 credits at PSU, after admis sion to PSU and prior to formal enrollment in the qualifying professional program. The student must be with in 48 credits of receiving a bachelor's degree from PSU at the time of matriculation into the professional program.

## GRADUATE SCHOOL

## Rossitza B. Wooster

## Dean of the Graduate School

## 184 Parkmill(1633 SW Park Avenue) 503-725-8410

## pdx.edu/gradschool

Portland State University graduate programs offer a variety of opportunities for advanced study and research, including preparation for academic or profes sional careers, continuation and improvement of skills for in-service professionals, personal intellectualenrichment, and professional development. More than 5,000 graduate students are enrolled in the University's colleges and schools, and over 1,900 graduate degrees are awarded annually in the more than 80 master's and the 21 doctoral programs.
The Graduate School oversees the University's graduate programs in the interest of ensuring quality instruction and research and promoting the highest achievement of graduate students. It is the principal res ource concerning graduate admis sion policies and procedures, advanced degree requirements, degree status, petition procedures, thesis or dissertation preparation, and final oral examinations.

All matters of graduate study are subject to the policies and procedures established by the Faculty Senate upon recommendation of the Graduate Council. The Graduate Council develops and recommends University policies and regulations for graduate studies, recommends standards for graduate courses and programs, and adjudicates petitions regarding graduate policies.

## Student responsibility

The student is responsible for knowing all regulations and procedures required by the University and the graduate programbeing pursued. In no case will a regulation be waived or an exception granted because of ignorance of the regulation or of the as sertion that the student was not informed by the adviser or other authority. The student should be familiar with information published in the Portland State University Bulletin, including the section on the Graduate Schooland the section listing the requirements for the degree and the offerings and requirements of the major department. The department chair appoints an adviser for each graduate student to assist in developing the course of study, determining deficiencies, planning the program, and clarifying special regulations. Departments can be expected to have additional degree requirements beyond those listed in the Bulletin.

A graduates tudent may petition the Graduate Council for the waiver of a University graduate academic regulation or degree requirement. The petition process is an option in unusual cases with extenuating circums tances. A petition is not a remedy forpoor advising on the part of an academic unit or poor planning by the student. The res ponsibility of initiating the petition rests with the student. Petition forms are available from the Graduate School. The decision of the Graduate Council is final.

The University reserves the right to require the withdrawal of any student who fails to acceptresponsibilities, as evidenced by conduct or scholastic achievement.

## Admissions requirements

## Graduate admission requirements

Graduate admis sion is selective and meeting minimum requirements does not guarantee admission. The number of students admitted to a particular program is limited to the resources and space available in each program. All applicants for a graduate degree or certificate program must meet minimum University admis sion requirements as well as departmental requirements.
University admis sion requirements include:

- A bachelor's degree froma regionally accredited institution
- Minimum GPA. To be considered for Regular (p.44) admission, applicants musthave a minimum cumulative undergraduate GPA of 2.75 or the equivalent (on the U.S. 4.0 scale) from the degree granting institution(s). Applicants who have earned 9 or more letter-graded graduate credits must have a minimum graduate GPA of 3.0 or the equivalent; this graduate GPA supersedes the undergraduate GPA. Applicants who have a cumulative undergraduate GPA between 2.5 and 2.74 or the equivalent fromthe degree granting institution(s) are eligible for University Conditional (p.44) status. After completing 9 lettergraded graduate credits at PSU with a GPA of 3.0 or higher, students with University Conditional status will automatically be given Regular status.
- Copies of transcripts fromall colleges and/or universities attended (except PSU), including junior colleges and community colleges
- \$65 application fee $+\$ 2$ processing fee
- Recommendation for admission fromthe appropriate graduate program's department
University enrollment requirements include:
- Verification of official transcripts fromdegree granting institution(s) and all colleges and/or universities attended where any graduatecredits were completed
- Proof of English language proficiency as demonstrated by:
- Completion of a bachelor's degree, master's degree, or doctoral degree in the U.S., Australia, Englishspeaking Canada, Ireland, New Zealand, or the U.K., or;
- Completion of Portland State's Intensive English Language Program(IELP) with a 3.50 GPA in all courses and recommendation fromthe IELP, or;
- Completion of one of the following exams:
- International Test of English as a Foreign Language (TOEFL), minimum overall score of 80; minimum subscores of 18 in reading and writing
- International English Testing Systems (IELTS) exam, minimum overall score of 6.5 ; minimum subscores of 6.5 in reading and writing
- Pearson Testof Eng lish-Academic (PTE), minimum score of 60 overall
- Duolingo English Test(DET), minimum score of 110
- Tests more than two years old are accepted if the score exceeds the minimumrequirement and the applicant has maintained continuous residency in the United States since the examdate
In cases when a student does not meet University admission requirements, departments may choose to submit a Graduate Admis sion-Special Approval Request to the Graduate School. This process may only be initiated by a department.
International applicants must als o submit:
- Copies of official degree certificates/diplomas
- Certified trans lation of transcripts and degree certificates/diplomas
- Financialdocumentation demonstrating adequate financial support for at least the first year of study
Depending on the individual graduate program, additional departmental requirements may include:
- Personalessay or statement of purpose
- Letters of recommendation
- Standardized test scores, e.g. GRE or GMAT
- Resume
- Writing samples
- Portfolio

Information regarding departmental requirements can only be obtained directly from the specific department.

## Three-Year Bridge program

This programis an alternatemethod of meeting graduate admis sion requirements. It is designed for international students coming fromnon-Bologna-compliant three-year baccalaureate degree programs recognized by the Ministries of Education in their home countries. This programcomprises approximately one year of academic study intended to bridge the differences between the applicant's degree and a four-year U.S. baccalaureate degree. Students are invited to participate in this program only if they have been recommended for admission by their departments.

1. Students graduating frominternational educational institutions with thirteen years of pre-collegiate work, 'Alevel' passes, and three-year bachelor's degrees are directly admissible to PSU graduate programs if they meet all other univers ity requirements.
2. As a general principle, students with twelve years of pre-collegiate education and three-year bachelor's degrees are admis sible to graduate programs at PSU only if they complete one additional year of acceptable coursework.
a. When additional coursework is required for admission to graduate study, specific courses must be approved by the Graduate School, in consultation with appropriate program/college officials.
b. Coursework is a year's duration and totals $30-42$ credit hours, with 16 graduate credits that can be applied towards a graduate degree.
3. 'Special Action' exceptions of Graduate School Conditional Admis sion could waive the additional year of additional work des cribe in \#2. Requests will be considered on the basis of acceptable evidence that the applicant is judged by appropriate campus authority to possess sufficient academic, professional and other potential pertinent to the applicant's educational objectives to merit such action. 'Special Action' exceptions require submission of additional information. Examples of additional information needed to support the request for Special Action admis sion are:
a. Test score results (GRE general and/or specialty tests; GMAT; departmental placementexaminations)
b. Completion of one year of college-level work at a regionally accredited U.S. university in a field related to the field of application
c. Department faculty evaluation of a portfolio of the student's work in the field (e.g., published articles, research, creative work, relevant awards, professional licensure)
d. Department faculty evaluation of coursework taken at
the international university (review of syllabi, reading lists, prerequisite preparation, recommendations) and of English communication skills
e. Commitment of individual faculty members who will act as advis ors to the student.
4. All special approval admis sions requests under either \#2 or \#3 above must be initiated by the department and processed through the Graduate School's admis sions system. Requests should include support for why special consideration should be considered.
5. When additional coursework is required for admis sion to graduate study, specific courses must be approved by the Graduate School, in consultation with appropriate program/college officials. Coursework is a year's duration and totals $30-42$ credit hours, with 16 of these credits countable towards the graduate program.
6. Admission to Portland State University to complete graduate admis sion preparation (\#2) or with a 'Special Action' exemption (\#3) does not confer 'baccalaureate possession' rights or privileges acceptable either for the seeking of an American teaching credential or for transfer to graduate programs at other U.S. higher education institutions. Moreover, students so admitted will not be eligible to earn a baccalaureate degree at the University.

## Admission statuses

All admitted graduate certificate and degree students will be as signed one of the following admis sion statuses:

## Regular status

To be considered for Regular status, applicants must have a minimum cumulative undergraduate GPA of 2.75 or the equivalent (on the U.S. 4.0 scale) from the degree granting institution(s). Applicants who have earned 9 or more lettergraded graduatecredits must have a minimum graduate GPA of 3.0 or the equivalent; this graduate GPA supersedes the undergraduate GPA.

## University Conditional status

Applicants who have a cumulative undergraduate GPA between 2.5 and 2.74 or the equivalent fromthe degreegranting institution(s) are eligible for University Conditional status. Students admitted with University Conditional status must achieve a 3.0 cumulative graduate GPA, based on all graduate courses taken at PSU, once they have completed 9 letter-graded graduate credits after admis sion. Students who meet the University Conditional status GPA requirement will automatically be converted to Regular status. Students with University Conditional status who do not earn a cumulative graduateGPA of 3.0 or higher once completing 9 letter-graded graduate credits at PSU after admis sion will have their admission canceled.

## Department Conditional status

Department Conditionalstatus may be imposed on a student who has a deficiency in departmental requirements. These conditions may include GPA requirements or additional coursework and may be more rigorous than University Conditional status or other University standards. Department Conditional status is removed once a department determines the appropriate requirements have been met. Students who do not fulfill the requirements of their Department Conditional status canhave their admis sion canceled by the department.

## Both University Conditional and Department Conditional status

Students who have both University Conditional status and Department Conditional status are subject to all of the policies stated above. University Conditional status and Department Conditional status are removed independent of each other, and usually not at the s ame time.

## Postbaccalaureate

Students not currently working toward a degree but who wish to regis ter for more than 8 graduate credits perterm may be admitted to postbaccalaureatestatus. A postbaccalaureate student may find departmental enrollment limitations on many courses.

A postbaccalaureate student wishing to be admitted to a graduate certificate or degree programmust apply in the same way as any other applicant, meet the general University requirements, and be recommended for admission by the department. Courses completed in a postbaccalaureate status are not automatically applied toward a graduate degree; each course must be evaluated and recommended by the department and is considered pre-admiss ion credit to which all pre-admis sion limits and requirements apply. See Pre-admis sion and transfer credit (p.47) for additionaldetails .

## Enrollment

## Validation of admission

Students must register for a minimum of 1 credit during their term of admis sion; failure to do so will result in cancellation of admis sion.

## Graduate grading system

The following grading scale is employed at the graduate level:

$$
\mathrm{A} \quad=4.00 \quad \text { B- } \quad=2.67 \quad \mathrm{D}+\quad=1.33
$$

| A- | $=3.67$ | $\mathrm{C}+$ | $=2.33$ | D | $=1.00$ |
| :--- | :--- | :--- | :--- | :--- | :--- |
| B+ | $=3.33$ | C | $=2.00$ | $\mathrm{D}-$ | $=0.67$ |
| B | $=3.00$ | $\mathrm{C}-$ | $=1.67$ | F | $=0.00$ |

The grading systemat the graduate level is defined as follows:

A-Excellent
B-Satisfactory
C-Below graduate standard
D-Failure
F-Failure
The following grades are also used; these marks do not impact the GPA:

P -Pass (B-or better)
NP—No Pass
I-Incomplete
IP-In progress
W-Withdrawal
X-Non-attendance/No basis for grade
M—Mis sing grade/No grade received AU—Audit

## Responsibility for dropping courses

It is the student's responsibility to drop courses they do not wish to attend. Non-attendance does not cancel the tuition charges nor prevent the course fromappearing on the student's academic record.

## Non-completion of course

A student who has participated in a course buthas failed to complete es sential work or attend examinations, and who has not communicated with theins tructor, will be as signed the appropriate grade based on coursework completed.

## Incompletes

Students do not have a right to receive/demand an Incomplete grade. The option of as signing an Incomplete grade is at the discretion of the instructor when the following criteria are met.
Eligibility Criteria

1. Required satisfactory course completion/participation. The quality of work is satisfactory, but some es sential work remains. In addition, the student musthave successfully completed most of the course work at the time the student requests the Incomplete, with a minimum grade up to that point of a B- for a graduate course.
2. Reasonable justification for the request. Reas ons for assigning the Incomplete must be acceptable to the instructor. A student does not have the right to demand an Incomplete. The circums tances should be unforeseen or beyond the control of the student. The instructor is entitled to request appropriate medical or other documentation to validate the student's request.
3. Incomplete grade is not a substitute for a poor grade. The Incomplete grade is not meant to create the opportunity for special or additional work for a student to raise a poor grade, or for the opportunity to take the course over by sitting in on the course in a later term without registering or paying for it.
4. Written agreement. A written or electronic agreement will be endorsed by both the instructor and student. The document will specify a) the remaining work to be completed, $b$ ) the highest grade which may be awarded upon submission of remaining items, andc) the date which the missing work is due. The latter may not exceed one year from the end of the termof enrollment for the given course. A template Incomplete Contract is available from the Regis trar.
5. Resolving the Incomplete. Instructors may not encouragestudents to "sit in" an entire future course in order to resolve the Incomplete grade. If the student needs to retake the entire course, they should be given the grade presently earned, and must formally regis ter for the future class they will be attending. If the mis sed portion of the course is no longer available, instructors may offer an alternate assignment. Grading weight of the alternate assignment should notexceed the original assignment. Students are fully responsible for monitoring all due dates.
Other Rules:
6. GPA Calculation. Incomplete grades are not included when calculating GPA.
7. Deadline for Completion. The deadline for completion of an Incomplete is one calendar year. The instructor may set a shorter deadline, which is binding. Any request for a longer deadline must be requested via petition to the GraduateCouncil.
8. Failure to make up an Incomplete by the end of one year. The Incomplete will become part of the student's permanent academic record for a graduate course.

## Drops and withdrawals

Drops/withdrawals froma course must be initiated by the student. It is the student's responsibility to drop/withdraw properly by the published deadlines dates.

A student may drop with no record on the transcript up to the end of the second week of the term. As a courtesy, students are advised to notify the ins tructor concerned of the intended or completed drop.

A student may withdraw for any reason before theend of the seventh week. Withdrawing in the third through seventh week will result in a " W " recorded on the transcript.
A student wishing to withdraw after the seventh week must petition the Deadline Appeals Committee. A " W " is recorded if the petition is approved.

Refunds are automatic and are calculated from the date of official drop/withdrawal. The refund is $100 \%$ only if the drop occurs within the first week of the term.

The above deadlines refer to fall, winter and spring terms. For deadlines during summer session, consult the Registrar's Academic Calendar.

## No Basis for Grade (X grades)

An X grade indicates No Bas is for Grade and is used when there is little or no attendance and there is no work/performance upon which to base an academic evaluation. $X$ grades cannot be changed after initial submis sion, and other grades cannot be changed to an $X$.

An auditor may also be assigned an X for insufficient attendance.

## Missing Grade (M grades)

If an instructor does not award a grade during the open grading window, an M grade (Missing) is automatically as signed. An M grade will change to a grade of X one term after the $M$ was initially assigned. Once converted to an $X$, the grade cannot be changed.
A graduatestudent will not be certified for graduation who has any M grades in PSU graduate courses that could potentially be letter graded, even if the courses are not applied to the student's degree.

## Audit (AU)

Graduate students may take any course for which they have the prerequisites and which is open to themon the basis of their admis sion category on an audit (no-credit) basis. The tuition and fees for auditing courses are the same as for taking the courses for credit, but a student's load (total credit hours) does not include audit enrollments. Audited courses cannot be used to meet any requirement for degrees or certificates, for required registration for graduate assistants, or for scholarship students. Students cannotreceive financial aid for audited courses. During the add-drop period, a studentregistered for a course for audit may change to credit status or vice versa through the official methods; thereafter, the change cannot be made.

## Academic record sealed after degree awarded

PSU academic records are sealed thirty days after the conferral of a degree. After this date, no changes can be
made to the academic record, such as removal of Incompletes or grade changes, except via petition to the Graduate Council.

## Catalog eligibility

To earn a graduate degree, students must meet the degree requirements published in a single, valid PSU Bulletin (catalog). The requirements in a catalog are valid for seven years; for example, the 2022-23 Bulletin can be used through summer 2029 graduation. Students can only use a catalog year during which they were both admitted and enrolled.

At the time a graduate programhas a change to their curriculumapproved, they may set more restrictive limits about which set of requirements (catalog year) can be used.

## Credit distribution and limitations

Courses applied to any graduate certificate or degree programmust be at the 500 or 600 level. Courses at the 700 and 800 level are not acceptable in any graduate certificate or degree programs, with the exception of 800level courses in the master's degree programs in the College of Education as well as some M.A.T./M.S.T. programs; these programs may allow a maximum of 6 credits at the 800 level. Student teaching credits cannot be applied to a graduate degree or certificate.
Students who take 400/500 courses at the 500 level must complete distinct requirements from those in the 400 -level section. With the exception of coursework taken as part of a bachelors+masters program (p. 48) or pre-admis sion (p. 47) credits taken while still an undergraduate, graduate tuition is charged for all graduate-level coursework.

At the master's level, a minimum of 12 credits in a 45credit programmust be taken in residence in 500, 500/600, or 600 course levelcategories. The remainder of the required credits may be 400/500 courses taken at the 500 level.

Limitations are placed on the number of $501,502,503$, $504,505,508$, and 509 credits that can be applied to master's degrees. In a 45 -credit program, the limits are as follows: a maximum of 12 credits in 501, 502, and 505 combined; a maximum of 9 credits in 504, 508, and 509 combined; a range of 6 to 9 credits in 503. Courses numbered 60x are included in these limitations.

## Repeat of graduate courses

If a graduate course is repeated, the grades awarded both times are included in the GPA. Repeating courses with the sole intent of raising the GPA is not acceptable.
A graduate course cannot be repeated and applied to degree requirements twice unless the course has been approved as repeatable for credit.

If a course offered as a 400/500 level course is taken for credit at the 400 level, the same coursecannot be taken again for credit at the 500 level.

## Correspondence credit

Under no circums tance will credit earned through correspondence study be acceptable toward a graduate degree or certificate.

## Academic load

Full-time enrollment for graduate students is 9-16 credits. Graduate students must obtain approval for registration in excess of 16 credits (graduate and undergraduate credits combined) via the Overload Approval form. A student registering for 17 to 19 credits must obtain the approval from their department chair or faculty adviser. A student registering for 20 credits or more must obtain the approval of their department chair and the Graduate School. A graduate assistant registering for more than 16 credits must obtain approval fromtheir department chair and the Graduate School.

ComputerScience and Electrical \& Computer Engineering graduate students have a lower maximum registration limit of 10 credits. These students mustobtain approval to reg ister for 11 or more credits via the Overload Approval form.

## Minimum enrollment

PSU requires that graduatestudents who are involved in activities requiring faculty time or the use of University facilities register every term(excluding summer), including those engaged in any phaseof research, such as collecting or developing data, or when engaged in any as pects of a project, thesis, or dis sertation.

After advancement to candidacy, doctoral students must be continuously enrolled for a minimum of 1 graduate credit every term(excluding summer) through the termof graduation.
A minimum of 1 graduate credit of regis tration is required in any term(including summer) when students are completing a major milestone for the degree such as taking any comprehensive or final examination, when holding a thesis/dissertation proposal or defense, and in the termof final thes is/dissertation submis sion and graduation.
The student's department can require additional regis tration in any giventermin relation to the amount of time required of faculty or the useof University facilities during the term.

## Residency requirements

Residencecredit is defined as credit taken at PSU after formal admis sion to a graduate degree program. Residency requirements are intended to ensure that students work in
close as sociation with other graduate scholars in the intellectual environment of PSU.

In a master's program, to meet the residency requirementa student must earn a minimum of two-thirds of the credits required for the degree after formal admission to a master's degree programat PSU.

In a doctoral program, the residency requirement can be satisfied in one of the following ways:

- Three terms of full-time enrollment (minimum 9 graduate credits applicable to the degree programeach term) during the first two years after admis sion to the program. This may include one or more summer terms.
- Six terms of part-time enrollment (minimum 1 graduate credit applicable to the degree programeach term) during the first two years after admis sion to the program. This may include one or more summer terms.
- A doctoral student who was enrolled in the same major at PSU, and whose matriculation to the doctoral programimmediately follows (within one calendar year) the master's degree program, may fulfill the residency requirement during the period in which the student was enrolled in the master's program.


## Pre-admission and transfer credit

Courses taken at any institution, including PSU, before the term of formal admis sion to a PSU graduate degree programare pre-admission credits. Courses taken at any other institution at any time are transfer credits. Transfer credits must be graduate credit taken at a regionally accredited institution and applicable to a graduate degree programwithout qualification at the originating institution.
A master's student mustearn a minimum of two-thirds of the credits required for the degree after formal admission to the graduate degree programat PSU and must earn a minimum of two-thirds of the credits required for the degree at PSU. Departments may have stricter limitations.

Pre-admission credits taken at PSU and applied to master's degree requirements must be letter-graded B- or higher or graded Pass. Pre-admis sion or transfer credits taken at another institution and applied to master's degree requirements must be letter-graded B - or higher (Pass or similar grading methods are not acceptable). All preadmis sion and transfer credits (whether taken at PSU or elsewhere) and applied to master's degree requirements must also meet all the following requirements: must not be used for any other degree at any institution (except for dual master's degrees (p.49)); must be no older than seven years old at the time the master's degree is awarded; and must total no more than one third of the required credits for a master' degree program. Otherwise eligible PSU credits applied toward a completed graduate certificate can be applied toward a subsequent master's degree without counting toward the pre-admis sion limits. For master's
degrees, pre-admission credits taken at PSU are requested via a DARS exception submitted to the Graduate School. This request should be made soon after admis sion to the graduate program. Transfer courses fromanother regionally accredited institution are requested via the Proposed Transfer Credit form(GO-21M) submitted to the Graduate School. It is strongly suggested that this formbe submitted early in the student's program. (The M.S.W. programhas specific transfer credit allowances resulting from accreditation requirements and inter-institutional agreements, buta minimum of 42 credits applied to the M.S.W. must be taken at PSU.)

For graduate certificates, two-thirds of the required credits, or 15 credits minimum, whichever is larger, must be taken at PSU. Individual programs may set higher minimums. Transfer credits for graduate certificates must be lettergraded B- or higher (Pass or similar grading methods are not acceptable) and must be no older than seven years old at the time the graduatecertificate is awarded. Transfer credits fromother institutions must be approved by the graduate certificate programand the Graduate School using the Proposed Transfer Credit form (GO-21M). Students are encouraged to apply for and be admitted to graduate certificate programs as early as possible.
For doctoral degrees, pre-admis sion and transfer limits are at the discretion of the individual doctoral programs; however, 603 Dissertation credits, or theirequivalent, cannot be transferred from another university. Transfer credits are requested via the Proposed Transfer Credit form (GO-21D) submitted to the Graduate School.
Approved graduate transfer courses fromother institutions are not entered on PSU transcripts and are not considered in the computation ofPSU cumulative graduate GPA. However, transfer courses are included in the approved programof study for all graduate certificate and degree programs and are used to calculate the programGPA, which must be 3.0 orhigher in order to graduate.
Pre-admiss sion and transfer credits frominternational institutions are subject to the same requirements and limitations. Requests for international pre-admis sion and transfer credits require additional documentation to facilitate verification of eligibility.

## Joint campus courses

Admitted graduate students at PSU may take graduate courses offered by the University of Oregon or Oregon Health and Science University through the Joint Campus regis tration process. Joint Campus (JC) regis tration allows PSU students to have a graduate course fromUO or OHSU included in their current termenrollment and tuition as sessment at PSU. For additional details, see the Graduate School website. JCcourses will be listed on the student's PSU transcript, however, JC courses are considered transfer credits (p.47) for which all transfer credit limitations apply. After the course is completed, students
will need to submit a GO-21 form to the Graduate School to request that the JC transfer credits be applied to their programof study at PSU.

## Course overlap between degrees and certificates

In specific circumstances, coursework only (not a project, thes is/dissertation, comprehensive exam, orother culminating activity) can be shared between programs. There are limits on the use of eligible graduate courses between graduate programs.

- A graduatecourse that has been used to meet the requirements for a bachelor's degree or any undergraduate programcannot beapplied to any graduate program (degree or certificate) unless the courses are part of a bachelors+masters program (p. 48) approved by the University, and the student has been admitted to that program.
- Graduate courses can be applied to two master's degrees only under the dual master's degrees ( p . 49) allowance.
- Graduate courses can be applied to a master's degree and a doctoral degree pro vided the mas ter's degree is awarded priorto or concurrent with the doctoral degree.
- Graduate courses can be applied to a master's degree and a graduate certificate.
- Graduate courses can be applied to a mas ter's degree and a post-baccertificate.
- Graduate courses can be applied to a doctoral degree and a graduate certificate.
- Graduate courses can be applied to two graduate certificates.
- Graduate courses can be applied to more than one doctoral program (at the discretion of both doctoral programs), but the following items must be completed at PSU for each doctoral degree: comprehensive exams, residency, proposal, advancement to candidacy, and dissertation research.
Departments can set more restrictive limits.


## Bachelors+masters programs

Bachelors + masters degree programs allow students to complete a bachelor's and master's degree at an accelerated pace. Students with upper-division standing may apply to an approved bachelors+masters degree program. The minimum institutional undergraduate GPA for admission to a bachelors+masters programcannotbe less than 3.30 ; beyond the GPA minimum, individual programs will set their own admis sions criteria. Students admitted to an approved bachelors+masters programcan share a maximum of 20 graduate credits between a bachelor's and master's degree. Programs may choose to
allow fewer shared credits. Shared credits will be cons idered pre-admission credits when applied to the master's degree.

After admis sion to a bachelors+masters degree program, students must maintain an institutional undergraduate GPA of 3.30 and earn a B or higher in graduate courses taken for shared credit. Students in a bachelors+masters program who are pursuing their first bachelor's degree will be as sessed undergraduate tuition for the graduate credits earned while working toward the bachelor's degree. Upon completion of the bachelor's degree, students who meet those requirements will be guaranteed admis sion to the master's program with shared credits. Students who do not meet those requirements would need to apply for admission to the master's degree programwithout the benefits of bachelors+masters shared coursework.

## Dual master's degrees

A student may work toward the completion of the requirements for two PSU master's degrees in complementary disciplines or toward a master's degree at PSU and a partner university when there is a formal agreement between the two institutions. Dual master's degrees allow for sharing of credits between the two degrees. The credits to be shared between both master's degrees cannot exceed one-third of the required credits for a degree. If the two degrees have different totalcredit requirements, the one-third limit is determined by the smaller total credit requirement. Only coursework can be shared between two master's degrees; comprehensive exam, internship, practicum, project, thesis, or other culminating activity cannot be shared. Students are limited to one use of one dual master's degree allowance at PSU. Dual degree credits must be approved by the student's departments and the Graduate School with a DualDegree Form (GO-14).

## Leave of absence

An admitted graduate student in good academic standing may request a leave of absence. A leave of absence (LoA) is a hiatus of a student's studies during which they are not registered and are not engaged in any phase of research or as pects of an exam, project, thesis, or dissertation. A leave of absence provides a guarantee that the student will be allowed to return to their graduate programat the agreedupon time and exempts the student fromthe continuous enrollment requirement (applicable only to advanced doctoral students). However, a leave of absence does not constitute a waiver of the time limit for completion of a graduate programnor the one-year limit for completion of a course.
A leave of absence is granted for a specific time period, up to a maximum of three terms (excluding summer). Students may request more than one leave of absence but all leaves combined cannot exceed sixterms. A student
with an approved leave of absence cannot: register for any coursework; engage in any phase of research or as pects of an exam, project, thesis, or dis sertation; or engage in any activities that require faculty time or use of University resources. It is the student's responsibility to drop or withdraw from all courses as well as notify other appropriate offices on campus of their leave status (Financial Aid, etc.).
A Graduate Leave of Absence Request mustbe submitted to the Graduate School no later than the Friday of the second week of the termfor which the leave of absence should take effect. A leave of absence will not be approved retroactively.

## Re-enrollment

Admitted graduate students who fail to enroll for credits for three consecutive terms (excluding summer) must submit a Graduate Re-Enrollment Request to their department. If this request is supported by their department, the formis signed and forwarded to the Graduate School for processing.
To ensure timely regis tration, the completed Graduate ReEnrollment Request should be received by the Graduate School no later than three weeks prior to the start of the term the student wishes to re-enroll.
Per Executive Order 13607, students who are re-enrolling after an interruption due to military service can re-enroll in the same program, with the s ame enrollment status and the same academic standing, which they had when the military service began if they wish. The period of military service and an additional period of up to three years (limited to five years total), may be excluded fromstandard University time limits. Students must notify the Graduate School that they are returning frommilitary services (and present appropriate documentation) so that the possible impact on time limits can be identified.

## Cancellation of admission to graduate program

If a student does not validate admission by registering and paying for at least 1 credit at PSU in the termof admis sion, that admis sion will be canceled unless the student contacts Graduate Admissions and requests that the admis sion be updated to another termwithin a one-year period. If the student does not validate admis sion within a one-year period, the admission will be canceled and the student must submit a new application and a new application fee.
A student with validated admission to a graduate certificate or degree program who during a one-year period (1) does not have an approved leave of absence and (2) does not successfully complete a graduate course in the approved programof study for the degree OR does not make satisfactory progress toward the degree (as determined by the department) may have admission to the degree program canceled. Additionally, a doctoral student who has not
been registered for three years will have admis sion to the degree programcanceled. For further information, students are urged to contact individual departments for departmental policies and practices.

## Faculty as student policy

PSU faculty members are encouraged to pursueadditional advanced degrees at other institutions. Faculty members above the rank of instructor are not eligible to receive an advanced degree in their own department or school at the University; however, in specialcircumstances, they may earn a degree in a department or school in which they do not hold an appointment.

## Academic Standing

All admitted graduate certificate and degree students at PSU must maintain good academic standing during the course of their graduate program. Good academic standing is defined as maintaining a cumulative graduate GPA of 3.00 or higher in all graduate credits earned at PSU. All graduate students, especially those in a conditional admis sion status, are expected to keep in close communication with their departments and to avail themselves of departmental advising.

## Academic probation

An admitted gradu ate student is placed on probation if their cumulative graduate GPA at PSU, based on the completion of 9 or more letter-graded graduate credits after admis sion to the graduate level at PSU, falls below 3.00.
While on academic probation a student will not be permitted to graduate, to be admitted to a new or different graduate certificate or degree program, to be advanced to doctoral candidacy, to have a thesis or dis sertation committee appointed, to receive or continue to hold a graduate assistantship, or to register for more than a total of 9 credit hours in any term. A student is removed from academic probation if their cumulative graduate GPA is brought up to 3.00 or higher once they have completed the next 9 letter-graded graduate credits after beginning probation status.

## Academic disqualification

Dis qualification occurs if:

1. A student on academic probation fails to achieve a cumulative graduate GPA of 3.00 or higher once they have completed the next 9 letter-graded graduate credits after beginning probation status; or
2. A student becomes subject to academic probation for a second time.

A student who is disqualified may not register for any graduate courses at PSU.

## Readmission after disqualification

Readmission after disqualification is not automatic. A disqualified student may petition for readmis sion as a student in a graduate certificate or degree programafter one calendar year. Readmis sion after the mandatory oneyear period is initiated by the student's filing of a petition for readmis sion to the GraduateCouncil through the Graduate School. Such a petition would need to address the circumstances that led to disqualification and provide evidence of preparedness to resume graduate study.

If a student's graduate programrecommends readmission, the Graduate Council may grant readmission, with or without additional academic requirements, or may recommend continued disqualification. A readmitted student must raise the cumulative graduate GPA to 3.00 or higher within the first 12 letter-graded credits after readmis sion or thes tudent will be disqualified.
Graduate courses completed at other institutions while a student is under disqualification at PSU will not be applied toward a graduate programat PSU.

## Academic honesty

Graduate students have a primary, unique relationship and responsibility to the faculty of the academic departments, the faculty upon whose recommendations graduate degrees are awarded. A major feature of the graduatestudent's responsibilities to the faculty is the adherence to academic honesty. Academic honesty is a requirement for all graduate activities and assumes that the student is honest, that all coursework and examinations represent the student's own work, and that all documents supporting the student's admis sion and graduation are accurate and complete. Any violation of academic honesty may be subject to disciplinary sanction as provided in the PSU Student Conduct Code.
Violations of academic honesty include but are not limited to:

1. Cheating in examinations and course assignments. The willful use or provision to others of unauthorized materials in written or oral examinations or in course assignments.
2. Plagiarism. The appropriation of language, ideas, and products of another author or artist and representation of themas one's own original work; failure to provide proper identification of source data; use of purchased or borrowed papers in graduate courses without complete identification of the source.
3. Selling or offering to sell course assignment materials. Selling or offering to sell material to another person; knowing, or under circums tances having reason to know, that the whole or a substantial part of the material is intended to be submitted in fulfillment of a course requirement.
4. Academic fraud. Furnishing false or incomplete information to the University with the intent to deceive; forging, altering, or misusing University documents or academic forms which serve as the basis for admis sion, course study, or graduation; mis representing a person's identity to an ins tructor or other University official.

Tuition, fees, and aid

## Basic graduate fees

Tuition and fees associated with graduate study at PSU are available from Student Financial Services. The admission application fee is required and is nonrefundable. All newly admitted graduate students are as sessed a one-time graduate matriculation fee in their initial term of admis sion. Graduate tuition and fees assessed each term depend on the total number of credits in enrolled classes, differential tuition, and resident or nonresident status in the state of Oregon.

## Financial assistance

## Graduate assistantships

The University offers graduate assistantships for teaching, research, and administrative support on a competitive basis for students working toward graduate degrees at PSU. To qualify and to remain eligible for an appointment, a student must be admitted to a graduate degree program, remain in good academic standing, and make satis factory academic progress towards their degree. Students wishing to apply for graduate assistantships must correspond directly with the appropriate department offering the assistantship.

## Scholarships

The Graduate School administers scholarships and awards through our office, and also provides links to external funding source.

## WICHE

Under the Western Interstate Commis sion for Higher Education (WICHE) Regional Graduate Program agreement, residents of Alaska, Arizona, California, Colorado, Commonwealth of Northern Mariana Is lands (CNMI), Hawaii, Idaho, Montana, Nevada, New Mexico, North Dakota, South Dakota, Utah, W ashington, and Wyoming admitted to specific degree programs are assessed resident tuition. A full list of approved programs is available on the application form. Completed applications are submitted to the Graduate School.

## Graduate programs

The graduate programs offered by Portland State University are listed below.

## Graduate Certificates

A graduatecertificate programis a linked series of approved graduate-level courses which constitute a coherent body of study with a specific defined focus within a discipline. Candidates for a graduate certificate musteam a minimum of 15 credits in approved graduate courses; many programs have higher minimums. A final project or portfolio may be required to provide for integration of the sequence of course materials.

## Master of Arts and Master of Science (M.A. and M.S.)

The University offers programs leading to the Master of Arts and the Master of Science. These programs are designed to develop a mastery of subject matter in a chosen discipline and to provide training and experiencein research.

Candidates for the Master of Arts and Master of Science degrees must earn a minimum of 45 credits in approved graduate courses; many programs havehigher minimums. A thes is may be required, depending on the program. The Master of Arts degree requires a demonstrated proficiency in a second language. Second language proficiency is not required for the Master of Science degree.

## Master of Arts in Teaching and Master of Science in Teaching (M.A.T. and M.S.T.)

The Master of Arts in Teaching and Master of Science in Teaching deg rees are designed to combine coursework in the major discipline with coursework in education. To this end, the programs are developed and administered within flexible guidelines to match the needs of students with varying backgrounds and professional plans. All M.A.T. degrees require a demonstrated proficiency in a second language. Second language proficiency is notrequired for the M.S.T. degree.
A minimum of 45 graduatecredits is required. The programof study includes the following:

1. At least 24 graduatecredits must be devoted to selected courses in academic fields which strengthen the candidate's scholarship in a teaching field and related area. This minimum may be higher at the department's discretion.
2. At least 9 credits of courses in education are required.
3. A final written and oral examination is required.

## Professional Degrees

PSU offers a variety of degrees which are designed to prepare students for work in profes sional fields. The programs are designed to develop a mastery of the subject matter in a chosen discipline and to provide practical training and experience in the field. Many professional
degrees require more than the minimum 45 credits required for all master's degrees at PSU.

## Doctor of Philosophy (Ph.D.)

The Doctor of Philosophy degree is awarded for scholastic achievement based upon the candidate's proven comprehensive knowledge in a specialized field of study and for creative scholarship through independent research. Judgment of such attainments is based upon the passing of comprehensive examinations and evaluation of a dissertation grounded in independent research.

## Doctor of Education (Ed.D)

The Doctor of Education degree is granted in recognition of mastery of theory, practice, and research in education. The Ed.D. in educational leadership programprepares highly qualified professional educators for positions in teaching, supervision, and administration in elementary and secondary education, in community and four-year colleges and universities, and in other educational institutions, both public and private.

## Degree and certificate requirements

## Graduate certificates

There are limits on the use of courses in graduate certificate programs that have not been fully approved through the curricular review process (i.e., courses numbered 501/601 through 510/610). A few graduate certificates require an omnibus course (e.g., 506 Project) as a culminating activity for the program. Apart fromthese required credits, courses numbered 501/601 through 509/609 are typically not allowed in graduate certificate programs. Experimental courses (i.e., courses numbered 510/610) can substitute for electives at the program's discretion, but all core courses must be fully approved.
All graduate certificates are approved with a minimum number of required credits. These minimum credit totals cannot be waived even if the approved programof study exceeds the University minimum of 15 credits for a graduate certificate.
Graduate certificate students must have a minimum 3.00 GPA on all courses applied to the programof study, as well as a minimum 3.00 GPA in all graduate-level courses taken at PSU, in order to graduate. Departments may es tablish a more rigorous standard. Although grades of $\mathrm{C}+$, C , and C - are below the graduate standard, they may be counted as credit toward a graduate certificate with the specific written approval of the program. Grades of D or F indicate clearly unacceptable work and cannot be applied to graduate certificate requirements. Audited courses cannot be used to meet any requirement for graduate certificates.

Courses completed up to seven years prior to the certificate award date may be used to satisfy graduate certificate requirements (e.g., a course started in the fall term of 2015 will be beyond the seven-year limitation at the close of fall term 2022).

For graduate certificates, transfercredit is defined as any eligible letter-graded (B-orhigher) graduate course taken at another regionally accredited institution. Two-thirds of the credits required for a graduate certificate, or 15 credits minimum, whichever is larger, must be taken at PSU. Individual programs may sethigher minimu ms. See the section on Course overlap between degrees and certificates (p. 48) for use of coursework in certificate programs.

Students must apply for graduation by the first Friday of the anticipated termof graduation; see the Graduate Candidate Deadlines for specific due dates. There is a required $\$ 30$ fee per application as well as a $\$ 2$ service charge. As a one-time courtesy, students who do not complete certificate requirements can have their application for graduation carried forward to a future term (typically the next term, but it could be at maximum up to one year in advance). To request that an application for graduation be carried, students must contact the Graduate School in writing and provide an explanation for the graduation delay. If students do not graduate a second time, the application for graduation will be dropped; they will then need to reapply for graduation by the appropriate deadline (and will be as sessed a new application fee).

## Master's degrees

## Second language requirement

The second language requirement for M.A. and M.A.T. students must be met before any final exam is taken or final graduation paperwork can be approved.
The Department of W orld Languages and Literatures has determined that the second language requirement for M.A. and M.A.T. students can be met in the following ways:

1. Equivalent coursework: Students who have passed a course equivalent to PSU level203 or higher in a second language will be deemed to have met the language requirement. The Graduate School will certify completion upon evaluation of the student's academic record if the requirement was completed at PSU. If the requirement was completed at a different institution, the Department of W orld Languages and Literatures will is sue a certificate of completion. M.A. and M.A.T. students are responsible for making their academic records available in the first termof admission and requesting evaluation and certification.
2. Students who do not meet therequirement under 1. above should make an appointment with the Department of World Languages and Literatures during the first term after their admis sion to make an
individualized plan for the completion of their language requirement. Options include preparing for and passing one of these evaluations:
a. Oral proficiency interview
b. A written test such as
i. The Graduate Student Foreign Language Test
ii. The CLEP exam
iii. A special exam, administered by the Department of World Languages and Literatures
c. Coursework after admis sion: taking a course at level 203 or above in residence or abroad
d. Special reading courses, if available.

The Department of World Languages and Literatures will teach and test only in languages in which it has expertise. However, off-campus arrangements may be possible with the cooperation of other institutions and the approval of the chair of the Department of W orld Languages and Literatures. Certification of having passed a second languageexamination froman institution other than PSU must be approved by the Department Chair of World Languages and Literatures.
A student whose native language is not English may meet the second language requirement in English, except for students in the M.A. in World Languages and Literatures, who are required to demonstrate fluency in two foreign languages other than English at the time of admis sion and are not required to demonstrate additional competency except as necessary to complete their degree requirements.

## Coursework and program of study

In the first year a student should prepare a proposed programof study in consultation with an adviser. The purpose of the planned programof study is to present an org anized, individualized plan for coursework, practica, and research activities consistent with the requirements for the proposed degree and approved by the adviser.
If PSU pre-admis sion credits are to be included on the programof study, the department must submit a DARS exception to the Graduate School. If trans fer credits (courses taken at any time from another regionally accredited institution) are to be included on the program of study, the Proposed Transfer Credit form (GO-21M) must be submitted to the Graduate School for approval. See Preadmis sion and transfer credit (p. 47) for detailed information.

All master's degrees are approved with a minimum number of required credits. These minimum credit totals cannot be waived even if the approved programof study exceeds the University minimum of 45 credits for a master's degree.

A student must have a minimum 3.00 GPA on the courses applied to the programof study, as well as a minimum 3.00 GPA in all graduate-level courses taken at PSU, in order to graduate. Departments may establish a more rigorous standard. Although grades of $\mathrm{C}+, \mathrm{C}$, and $\mathrm{C}-$ are below the graduate standard, they may be counted as credit toward a master's degree with the specific written approval of the departmentif taken at PSU after the termof formal admis sion to the graduate program. Grades of $D$ or $F$ indicate clearly unacceptable work and cannot be applied to graduate degree requirements. Audited courses cannot be used to meet any requirement for master's degrees.
A grade of IP (In Progress) may be used for 501 Research and for 506 Project when a student is progressing in an acceptable manner toward completion of the work; final grades for 501 and 506 credits are submitted by the instructor via an online grade change. An IP grade must be used for 503 Thes is when a student is progressing in an acceptable manner; final grades for 503 credits are assigned by the instructor on the Recommendation for the Degree form (GO-17M) and posted to the student's transcript after approval of the thesis and certification for graduation by the Graduate School.

All cours ework applied to the master's degree program must be completed within the seven years prior to the awarding of the degree (e.g., a course started in the fall term of 2015 will be beyond the seven-year limitation at the close of fall term 2022).

## Degree application

Students must apply for graduation by the first Friday of the anticipated term of graduation; see the Graduate Candidate Deadlines for specific due dates. There is a required $\$ 30$ fee per application as well as a $\$ 2$ service charge.

As a one-time courtesy, students who do not complete degree requirements can have their application for graduation carried forward to a future term(ty pically the next term, but it could be at maximum up to one year in advance). To request that an application for graduation be carried, students must contact the Graduate School in writing and provide an explanation for the graduation delay. If students do not graduate a second time, the application for graduation will be dropped; they will then need to reapply for graduation by the appropriate deadline (and will be assessed a new application fee).

## Validation of out-of-date graduate credit

A PSU course more than seven years old at the time of graduation, but no more than ten years old at the time of graduation, may be used toward master's degree requirements after a successful validation exam(for example, a course taken in fall 2012 may be validated for a graduation termno later than fall 2022). A separate validation examination must be given for each course, in
accordance with the full requirements listed on the GO-15 form. Departments are expected to limit validation examinations to those courses that are current and relevant in the discipline and meet the current requirements of the master's degree program. Validated courses are limited to one third of the programrequirements (e.g., 15 credits total in a 45 -credit program). Each examination attempted, regardless of result, has a fee of $\$ 50.00$, which will be credited to the department giving theexam. Payment must be arranged in advance of the exam through the Graduate School and Cashiers.

In very unusual cases, with the specific agreement of both the student's department and the department most equivalent to the original cours e department, a student may validate a graduate course fromanother regionally accredited institution, in accordance with thefull requirements listed on the GO- 15 form.

## Human Research Protection Program

All research involving human subjects conducted by faculty, staff, or students in any programat PSU must have Human Research Protection Program(HRPP) approval. This policy applies to all research under the auspices of the University, including surveys and questionnaires, whether supported by grant, contract, gift, University, or personal funds. The student should allow a minimum of six weeks for the approval process. A student cannot have a thesis committee appointed until HRPP approval is granted.

## Final examination

If a final examination is required by thestudent's department, it must be taken after successful completion of any required second language examination and after at least 30 credits have been completed. The examination is not a re-examination over coursework but rather a test of the candidate's ability to integrate material in the major and related fields, including the work in any thesis or research project. A minimum of 1 graduate credit of registration is required whentaking any final oral or written examination.

## Oral examinations

In the case of a non-thesis oral examination, the committee must consist of at least two members of the student's department, including the student's adviser. At the discretion of the department, a faculty member from another department may be added. ForM.A.T. and M.S.T. students, one additional member of the committee is required to be a faculty member from the College of Education or a faculty member with pedagogical expertise in the student's discipline.
Non-thesis final oral examinations (including final project presentations) can only be held during regular academic terms, i.e., not between terms. Examinations must be scheduled and completed by the Friday of finals week for
graduation in that term. For summerterm graduation, the deadline applies to the regular eight-week summer session dates, i.e., exams must be scheduled and completed by the Friday of the eighth week of summer term.
Passing of the final oralexamination requires a majority approval. If the student fails the entire examination or any section thereof, the department may dismiss the student from the master's programor permit the student to repeat the entire examination, or the section that was failed, after a minimum of three months. The results of the second examination are final.

## Written examinations

If a final written examination is required, it can only be held during regular academic terms, i.e., not between terms. Examinations must be scheduled and completed by the Friday of finals week for graduation in that term. For summer term graduation, the deadline applies to the regular eight-week summer session dates, i.e., exams must be scheduled and completed by the Friday of the eighth week of summer term.
If the student fails the entire examination or any section thereof, the department may dismiss the student fromthe master's degree programor permit the student to repeat the entire examination, or the section that was failed, after a minimum of three months. The results of the second examination are final.

## Thesis

The presentation of a thesis as partial fulfillment of the requirements for the master's degree is required in certain departments and is an option in others. Each school, college, and department defines the nature of research and scholarship accepted for a thesis, but in all cases a high level of resourcefulness, productivity, and mature perception of the discipline is expected. The quality of the culminating work must meet University standards and reflect those of other leading universities. Although the thes is is notrequired to show original results, it must reveal independent investigation, including the knowledge and application of the accepted methods of scholarship and research methodology. The thesis represents the independent work of the student and must be developed under the direction of the thesis adviser.

The thesis committee must be approved by the Graduate Schoolusing the GO-16M form in advance of the thesis defense. The committee must consist of at least three and not more than five faculty members. The chair of the thesis committee must be regular, full-time PSU instructional faculty, tenured or tenure track, as sistant professor or higher in rank; the other committee members may be nontenure track or adjunct faculty. Two of the committee members (the committee chair and one other member) must be from the student's department; the third member may be from the student's department or may be PSU
faculty fromanother department or OHSU faculty. If it is neces sary to gooff campus for one additional committee member with specific expertise not available among PSU faculty, a CV for that proposed member must be presented with the GO-16M form; that member must be in addition to the required three PSU faculty members. All committee members must have master's degrees or higher.
Students must be registered for at least 1 graduate credit in every termin which they are working on any phase of their thesis, including data development or collection, writing, revision, defense, and finalization through approval by the Graduate School. Students must register for at least 6 to 9 credits of 503 Thesis in their department. (Since students must be continuously enrolled while working on the thesis, they frequently accumulate more than 9 credits of 503 Thesis. However, a maximum of 9 credit of 503 Thesis may be applied to the programof study.) IP (In Progress) is the interim grade reported until the thesis is defended and approved by the student's thesis committee. Final grades for thesis credits are not recorded until the thesis has been approved by the Graduate School.
A thesis defense may be scheduled only during the regular academic terms, no later than five weeks prior to the close of the termof application for graduation in which the degree will be granted (i.e., must be completed four weeks before the beginning of finals week). For summer term graduation, deadlines apply to the regular eight-week summer ses sion dates. Later completion will result in graduation in a subsequent term. The student must deliver a final draft of the thesis to all members of the approved committee no fewer than 14 days before the thesis defense.
A thes is defense musttake place in a meeting with the student and the entire, appointed committee. While it is expected that all members should be physically present, remote participation is permitted under specific conditions. The student's oral presentation should notexceed 60 minutes. The thesis defense is open to the University faculty and may be open to the public at the department's discretion. Pas sing of the thesis defense requires a majority approval. If the student fails the thesis defense, the department may dismiss the student fromthe master's programor permit the student to hold a second defense after a minimum of three months. The results of the second defenseare final.
After passing the thesis defense, the student will be required to make any necessary edits and revisions. The final, post-defense version of the thesis mustbe approved by committee members by signing the Thesis Signature Page. For final approval, a majority of committee members must sign the Thesis Signature Page.
The final thesis must be submitted to the Graduate School not later than three weeks prior to the close of the termof application for graduation. See the Graduate Candidate Deadlines for specific dates. Fordetails about thesis
formatting and submis sion, see the Thesis and Dis sertation Information available from the Graduate School.

## Doctoral degrees

## Preliminary examination

Early in the doctoral programthe student may be required to take preliminary examinations. The scope and content of the examination, and the standard of performance, is determined by the doctoral program.

## Advisory committee

When a student enters the doctoral program, a faculty adviser will be designated by the programto advise the student and to meet in regular consultation concerning the programof study and research. It is recommended that students als ohave an advisory committee appointed that should consist of at least three faculty members representative of the student's field of study. The members of the advisory committee should be appointed after successful completion of 9 credits and notlater than six months prior to the completion of the comprehensive examinations.

## Language requirement

For the $\mathrm{Ph} . \mathrm{D}$. degree, the student may be required to demonstratecompetency in at least one second language. Any second language requirement must be completed before the comprehensive examinations.

## Residency requirement

Residency for a doctoral degree programcan be satisfied in one of the following ways:

- Three terms of full-time enrollment (minimum 9 graduate credits applicable to the degree programeach term) during the first two years after admis sion to the program. This may include one or more summerterms.
- Six terms of part-time enrollment (minimum 1 graduate credit applicable to the degree programeach term) during the first two years after admis sion to the program. This may include one or more summerterms.
- A doctoral student who was enrolled in the s ame major at PSU, and whose matriculation to the doctoral programimmediately follows (within one calendar year) the master's degree program, may fulfill the residency requirement during the period in which the student was enrolled in the master's program.


## Coursework and doctoral program of study

The doctoral programof study includes coursework, research, internships, and/or seminar credits according to the requirements of the individual doctoral program. A minimum 27 credits of 603 Dis sertation is required for all

Ph.D. students; a minimum of 18 credits of 603 Dissertation is required for all Ed.D. students. A minimum of three academic years of graduate study beyond the bachelor's degree (equivalent to 81 quarter credits minimum) is required for all doctoral degrees.
All doctoral degrees are approved with a minimum number of required credits. These minimum credit totals cannot be waived even if the approved programof study exceeds the University minimum of 81 credits for a doctoral degree.
For doctoral degrees, pre-admis sion and transfer limits are at the discretion of the individual doctoral programs; however, 603 Dis sertation credits, or theirequivalent, cannot be transferred from another university. Transfer credits are approved via a GO-21D form submitted to the Graduate School. See Pre-admis sion and transfer credit (p. 47) for detailed information. While potentially all coursework for the degree can be transferred fromanother institution, the following items must be completed at PSU: comprehensive exams, residency, proposal, advancement to candidacy, and dissertation research.
A student must have a minimum 3.00 GPA on the courses applied to the programof study, as well as a minimum 3.00 GPA in all graduate-level courses taken at PSU, in order to graduate. Doctoral programs may establish a more rigorous standard. Although grades of $\mathrm{C}+, \mathrm{C}$, and C - are below the graduate standard, they may be counted as credit toward a doctoral degree with the specific written approval of the doctoral program. Grades of DorF indicate clearly unacceptable work and cannot be applied to graduate degree requirements. Audited courses cannot be used to meet any requirement for doctoral degrees.

A grade of IP (In Progress) may be used for 601 Research and for 606 Project when a studentis progressing in an acceptable manner toward completion of the work; final grades for 601 and 606 credits are as signed by the instructor via an online grade change. An IP grade must be used for 603 Dissertation when a student is progressing in an acceptable manner; final grades for 603 Dis sertation credits are assigned by the instructor on the
Recommendation for the Degree form (GO-17D) and posted to the student's transcript after approval of the dissertation and certification for graduation by the Graduate School.

All coursework on the program of study, with the possible exception of seminar and internships, must be completed before a student can be advanced to doctoral candidacy. All coursework on the program of study must be satis factorily completed before graduation.
For students entering a doctoral program with a master's degree, a maximum of five years will be allowed from admis sion to completion of all required comprehensive examinations. Forstudents entering with a bachelor's degree, a maximum of two additional years will be added to this limit, for a maximum of seven years fromadmission
to completion of all comprehensive examinations. Failure to meet this time limit will result in cancellation of admis sion to the doctoral program.

## Comprehensive examination

Before advancementto candidacy and not less than one academic year before all requirements for the doctoral degree are expected to be completed, the student must pass a series of comprehensive examinations in the field of specialization. The examinations may be written, oral, or both. The comprehensive examinations may not be taken until the language requirement, if any, and substantially all the coursework for the degreehave been completed. Students must be registered for a minimum of 1 graduate credit during the termcomprehensive exams are taken. Comprehensive exams are scheduled and administered in accordance with the established rules of the program, which must be made publicly available to students via the program's website or doctoral student handbook. Comprehensive exams can only be offered during regular academic terms, i.e., not between terms. The doctoral programmust notify the Graduate School the student has passed comprehensive exams by submitting the GO-22 form.
If the student fails the entire comprehensive exam or any section thereof, the doctoral programmay dis miss the student from the degree programor permit the student to repeat the entire examination, or the section that was failed, after a minimum of three months. The results of the second examination are final.
A maximum of three years will be allowed from the completion of comprehensive examinations to advancement to candidacy. Failure to meet this time limit will result in cancellation of admission to the octoral program.

## Dissertation proposal

After passing the comprehensiveexamination and identifying a dis sertation topic, a dissertation committee is appointed and the student must pass a proposal defense. The dis sertation committee will take the place of the advisory committee and the faculty adv iser is superseded by the dissertation adviser. The dissertation committee must be approved by the Graduate School using the Appointment of Doctoral Dissertation Committee form (GO-16D).
The dis sertation committee must consist of four to six PSU faculty members: the dissertation adviser and a minimum of three and a maximum of five regular members. The chair of the dissertation committee must be regular, fulltime PSU instructional faculty, tenured or tenuretrack, as sis tant professor or higher in rank; the other three to five committee members may include non-tenure track or adjunct faculty and/or members of the OHSU faculty. If it is necessary to go off-campus for one committee member
with specific expertise not available among PSU faculty, a curriculumvitae (CV) for that proposed member must be presented with the GO-16D form. This off-campus member may substitute for one of the three to five regular committee members. All committee members must have doctoral degrees. At the discretion of the program, the designation of co-chair can be requested on the GO-16D form for one regular member of the committee. The designation of co-chair recognizes the significant academic advis ing role of the committee member, but oversight of the process and procedures and all administrative responsibilities remains with thechair.
No proposal defense shall be valid without a dis sertation committee approved by the Graduate School. The GO-16D form should be submitted to the Graduate School a minimum of six weeks in advanceof the estimated date of the dis sertation proposal meeting. The student must deliver a draft of the dissertation proposal to all members of the approved committee no fewer than 14 days before the proposaldefense.
A dissertation proposal must take place in a meeting with the student and theentire, appointed committee. While it is expected that allmembers should be physically present, remote participation is permitted under specific conditions. The student will make an oral presentation of the written proposal for discussion, evaluation, and suggested modification. The final proposal submitted to the committee for approval should be sufficiently detailed and clear to provide a blueprint for the study to follow. The proposal is expected to include the following:

1. General nature and present status of knowledge of the problem.
2. The theoretical and empirical framework within which the proposed problemexists.
3. The significance of the proposed research and its likely contributions.
4. The research methodology to be used.

The doctoral programrecommends the student for advancement to candidacy once the dissertation proposal has been approved.

## Human Research Protection Program

All research involving human subjects conducted by faculty, staff or students in any programat PSU must have Human Research Protection Program(HRPP) approval. This policy applies to all research under the auspices of the University, including surveys and questionnaires, whether supported by grant, contract, gift, University, or personal funds. After proposal approval, the studentmust submit a HRPP application to the Office of Research Integrity if human subjects are involved in the research in any way. A student cannot be advanced to candidacy until HRPP
approval is granted. The student should allow a minimum of six weeks for the approval process.

## Advancement to Candidacy

A student is advanced to candidacy after successful defenseof the dissertation proposal and with the recommendation of the doctoral program, after verification of the student's programofstudy, and after HRPP approval has been granted (if applicable). The doctoral programmust request ad vancement to candidacy by submitting the GO-23 form to the Graduate School. The Dean of the Graduate School retains final approval authority for advancement to candidacy.
A doctoral candidatehas a minimum of four months and a maximum of five years from the effective date of advancement to candidacy to complete all requirements for graduation, including defense of the dis sertation and its final approval by the Graduate School (doctoral programs may have stricter requirements). Candidates must be continuously enrolled during that period. Failure to meet this time limit will result in cancellation of admis sion to the doctoral program.

## Dissertation preparation

With guidanceof the dissertation committee, the candidate presents a dis sertation setting forth the results of original and independent investigation. The dissertation must constitute a contribution to knowledge, significantly enlarging, modifying, or reinterpreting what was previously known. Untilthe degree is granted, the student enrolls for the number of graduatecredits appropriate to the amount of University services utilized, as determined by the dissertation adviser, with a minimum of 1 graduate credit each term. Ph.D. students must register for a minimum of 27 credits of 603 Dissertation before graduation; Ed.D. students must register for a minimum of 18 credits of 603 Dissertation before graduation. Continuous enrollment of a minimum 1 graduate credit is required through the terma student graduates, even if this results in more than 27 (18) credits of 603 Dis sertation at the time of graduation. Ph.D. and Ed.D. students should only regis ter for 603 Dis sertation credits after advancement to candidacy.

## Degree application

Students must apply for graduation by the first Friday of the anticipated termof graduation; see the Graduate Candidate Deadlines for specific due dates. There is a required $\$ 30$ fee per application as well as a $\$ 2$ service charge.
As a one-time courtesy, students who do not complete degree requirements canhave their application for graduation carried forward to a future term(typically the next term, but it could be at maximum up to one year in advance). To request that an application for graduation be
carried, students mustcontact the Graduate School in writing and provide an explanation for the graduation delay. If students do not graduate a second time, the application for graduation will be dropped; they will then need to reapply for graduation by the appropriate deadline (and will be as sessed a new fee).

## Dissertation defense

After preparation of the written dissertation, the candidate's dissertation committee will conduct a dissertation defense. A dissertation defense may be scheduled only during the regular academic terms, no later than five weeks prior to the close of the termof application for graduation in which the degree will be granted (i.e., must be completed four weeks before the beginning of finals week). For summer term graduation, deadlines apply to the regular eight-week summer session dates. Later completion will result in graduation in a subsequent term. The student must deliver a final draft of the dissertation to all members of the approved committee no fewer than 14 days before the dis sertation defense.
The dis sertation defense, which is open to the public, is the culminating experience in the doctoral studies. The candidate is expected to prepare an oral presentation on the research methodology and results. Theoral presentation should not exceed 60 minutes. Following the oral presentation, the candidate must defend the dissertation as a worthy contribution to knowledge in its field and must demonstrate a mastery of the field of specialization as it is related to the dis sertation. The questioning and discussion are for the purposeof: (1) furtherenlightenment of the candidate and the committee of the significance and limitations of the research, and (2) demonstration that the candidate has met the high expectations of the University for the awarding of the doctoral degree.
A dissertation defense must take place in a meeting with the student and theentire, appointed committee. While it is expected that allmembers should be physically present, remote participation is permitted under specific conditions. For dis sertation approval, there may be no more than one dis senting vote on the dissertation defense. If the student fails the dissertation defense, the doctoral programmay dis mis s the student fromthe program or permit the student to hold a second defense after a minimum of three months. The results of the second defense are final.
After pas sing the dissertation defense, the student will be required to make any necessary edits and revisions. The final, post-defense version of the dis sertation must be approved by committee members by signing the Dis sertation Signature Page. For final approval, there may be no more than one committee member who does not approve the final, post-defense version of the dis sertation by not signing the Dis sertation Signature Page.
The final dis sertation must be submitted to the Graduate School not later than three weeks prior to the close of the
term of application for graduation. See the Graduate Candidate Deadlines for specific dates. For details about thes is formatting and submission, see the Thesis and Dis sertation Information available from the Graduate School.

## Time limitations

Forstudents entering a doctoral programwith a master's degree, a maximum of five years will be allowed from admission to completion of all required comprehensive examinations. For students entering with a bachelor's degree, a maximum of two additional years will be added to this limit, for a maximum of seven years fromadmission to completion of all comprehensive examinations. Doctoral programs may have stricter requirements. Failure to meet this time limit will result in cancellation of admis sion to the doctoral program.
A maximum of three years will be allowed from the completion of comprehensive examinations to advancement to candidacy. Doctoral programs may have stricter requirements. Failure to meet this time limit will result in cancellation of admiss ion to the doctoral program.
A doctoral candidatehas a minimum of four months and a maximum of five years fromthe effective date of advancement to candidacy to complete all requirements for graduation, including defense of the dis sertation and its final approval by the Graduate School. Doctoral programs may have stricter requirements. Candidates must be continuously enrolled during thatperiod. Failure to meet this time limit will result in cancellation of admis sion to the doctoral program.

## A TO Z LIST OF STUDENT SERVICES

## Advising and Career Services

The Advising \& CareerServices Division includes academic advising, career, and transfer services at Portland State University.

## Undergraduate Advising Resource Center

FMH 360
503-725-3822
www.pdx.edu/advising
The Undergraduate Advising Resource Center serves as the hub forthe Advising and Career Services Division at Portland State University. Academic advising is organized into seven Advising Pathways which group majors with similar academic and career paths, giving students the best opportunity to stay with the same advis or and pathway, even if they change their major. Students are as signed to an advis or who helps them to understand graduation requirements, create degree plans, and successfully achieve their educational goals. (Please note some Advising Pathways are served in other locations.)

## University Career Center

FMH 342
503-725-4613
www.pdx.edu/careers
The University Career Center provides support to all PSU students and alumni in all aspects of their career development including: exploration, preparation and planning, job and internship searching, and making career changes and transitions through individual appointments, drop ins, works hops, classes and extensive online resources. They also maintain the job and internship portal, Handshake, and coordinate several career fairs and employer visits each academic year.

## Transfer \& Returning Student Resource Center

FMH 342
503-725-2136
www.pdx.edu/transfer-center/

The Transfer and Returning Student ResourceCenter (TRSRC) helps prospective transfer students, and students returning orenrolling after a break in theireducation, smoothly transition to PSU. The TRSRC supports transfer and returning student degree completion through early and proactive academic and career advising and provision of assistance with accessing PSU resources and services.

## ASPSU Children's Center

## Smith Memorial Student Union, First Floor 1825 SW Broadway <br> 503-725-2273

The Children's Center is designed for short hour and fullday care for students, staff and faculty who need 8 or more hours of child care each week. Hours are reserved each term to accommodate family schedule needs. The Center features two spacious classrooms in which children learn through active exploration in an environment with engaging materials and opportunities to connect socially.
The Center is open M-Th: 8:00-6:00 and F: 8:005:30 serving children ages 6 month to age 9 .

## Basic Needs Hub

## 435 Smith Memorial Student Union 503-725-2740 <br> basicneedshub@ pdx.edu www.pdx.edu/dean-student-life/basic-needs-hub

The Bas ic Needs Hub provides students with oneplace to stop for all concerns related to providing for basic needs support, such as housing assis tance, food as sistance, emergency funds, and more. The goal is to support students with their most basic needs so that they can focus on their academic, work, and personal goals.

## Box Office

Box Office
120 Smith Memorial Student Union
Broadway Lobby
503-725-3307
portlandstate.universitytickets.com
The Portland State BoxOffice is your one-stop shop for event tickets, campus information and lockerrentals. We serve as the Information Desk for the university, and sell tickets for university events and external events held at Portland State venues, ranging fromcommencement ceremonies and Viking Athletics' games tostudentorg anized functions and cultural events. Purchase event
tickets online at portlands tate.universitytickets.com or in person at 120 SMSU in the Broadway lobby of the Smith Memorial Student Union.

Short-termand long-termgeneral lockers are available for rent all year round through the BoxOffice. Lockers are located in Cramer Hall and Science Building One (SB1). No need to bring your own lock-the lockers have built-in locks with combinations for your convenience.

## Campus Event Services

CAMPUS EVENT SERVICES
Campus Events \& Student Union
1825 SW Broadway, Suite 119
Smith Memorial Student Union
503-725-2663
conferences@pdx.edu
https://www.pdx.edu/conferences/

Portland State hosts thousands of on-campus events every year. Recognized student groups, PSU departments and external organizers can plan theirgatherings with the as sistance of the Campus Events \& Student Union office. CESU provides all the basics for a successful meeting or event in clean, convenient spaces. The CESU staff als o can connect you with CAVET audio-visual services and campus catering if your event needs something extra.

## Campus Public Safety Office

## Campus Public Safety Office

503-725-4407(24/7)
503-725-5911 (emergencies only) 633 SW Montgomery
www.pdx.edu/cpso
Portland State University Campus Public Safety currently has an allocated force of 12 s worn police officers, 8 nonsworn public safety officers, 5 ambass adors, and 20 profes sional staff. Our police officers have graduated from a Department of Public Safety Standards and Training (DPSST) academy and are empowered by section 161.015 of the Oregon Revised Statutes. Sworn officers possess the same authority and adhere to the same state-mandated standards, as municipal police officers.
Whether on foot, behind the wheel of a patrol car, or on bike, officers are here to protect and serve the campus community 24 -hours a day, every day of the year. Officers take pride in delivering superior law enforcement services to the Univers ity community. Public Safety Officers engage in preventative patrol to observe and report, may respond to calls for service that do not require theexercise of police authority.
Campus Dispatch is a 24-hourcentral communications hub located at 633 SW Montgomery that provides the

University community with access to a myriad of res ources both internally and externally, including but not limited to, escorts, suspicious activities, medical emergencies, or crime reporting.
Public Safety also provides an annual report on October 1st on the reported crimes occurring in the previous calendar years. Data is collected from variety of sources, including PPB and various University departments; DOSL, ResLife, Athletics, HRC, SALP, GDI and the WRC.

Portland State University currently has over 27,229 regis tered students, and over 6,944 faculty and staff members. Our officers and dis patchers handle over 3,300 calls for service a year and address crime and quality of life issues. Weare res ponsible for providing physical security services to Portland State University and to work closely with the local, state, and federal police agencies to provide a safe and healthy community for learning.

## Campus Recreation

## Campus Recreation

Academic and Student Rec Center
1800 SW Sixth Avenue
Portland, OR 97201
503-725-5127
campusrec@pdx.edu
www.pdx.edu/recreation
Campus Rec creates an en vironment where quality recreation and wellness programs inspire, empower and educate. Through our accessible and innovative programs and facilities, Campus Rec supports a healthy, happy, engaged Portland State community. All Portland State students are members and we also offerfaculty, staff, alumni and plus one memberships.
As one of the largest student employers on campus, we support the occupational wellbeing ofPSU students with practical job training, mentorship, and leadership opportunities that complement the academic experience.
Good health, memorable experiences and learning are at your fingertips. Come play with us !

## Aquatics \& Safety

Make a splash with Campus Rec's Aquatics program. Destress, exercise, and have fun in our state-of-the-art, 25yard pool and 10-person spa. Programs offered include lap swim, open rec s wim, and special events that are available to Campus Rec members for free. Adult swimclinics, youth swimles sons, and First Aid/CPR/AED and lifeguard certification courses are available for a fee.

## Fitness \& Wellbeing

Campus Rec contributes to physical and emotional
wellbeing by providing a flexible fitness programthat is convenient for the Portland State community. We offer cardio, endurance, strength, mind/body, and dance fitness clas ses led by certified and motivational instructors. Our affordable personal training programbring s clients closer to their goals, and our wellbeing teamengages the entire campus community with annualevents and programs such as Walktober. The Rec Center features an indoor track and nearly 200 pieces of cardio and strength equipment.

## Inclusive Rec

Campus Rec celebrates diversity, inclusiveness, and authenticity in all of our programs. Our Inclusive Rec offerings demonstrateour commitment to creating holistic wellbeing and a welcoming community for all. Enjoy acces sible spaces, programs, and equipment, including outdoor trips, adaptive climbing and swimming, wheelchair sports, goalball, open inclusive rec time, and youth events for the entire PSU community.

## Intramurals

Intramural Sports provideCampus Rec members of all skill levels with opportunities to participate in sports, make new friends, and be active in a safe, fun environment. Build community while playing in leagues, pickupgames, tournaments, and events. Offerings change every termand include: basketball, soccer (indoor and outdoor), volleyball, slowpitch s oftball, kickball, cornhole, table tennis, and foamarchery tag.

## Outdoor Program

Since 1966, the Outdoor Program(ODP) has helped the Portland State community to access and enjoy the great outdoors, build community, increase environmental awareness, and provide exciting experiences in new settings. The ODP provides a wide variety of opportunities including guided outdoor trips, workshops and certification courses, outdoor rental gear at affordable rates, and an indoor Climbing Center. Whether you are looking to embark on an adventure or learn a new outdoor skill, join us in exploring the wild side of Oregon.

## Rec Clubs

Portland State Rec Clubs is a student-led programthat provides opportunities for recreation and intercollegiate
competition between students of all skill and ability levels. Participate in your favorite sports and activities, build community, and practice transferable leadership skills in a safe and supportive environment. Our 30+ clubs are educational, accessible, organized by students, and funded by student fees. Join an existing Rec Club or start a brand new club of your own.

## Center for Student Health and Counseling (SHAC)

Center for Student Health and Counseling (SHAC) Uni versity Center Building 1800 SW 6th Avenue

## www.pdx.e du/health-counseling

The CenterforStudent Health and Counseling (SHAC) provides high quality, accessible health and wellness services to PSU students. SHAC is comprised of:

- DentalServices (p.67)
- Counseling Services (p. 67)
- Health Services (p.68)
- Health Promotion and Education (p. 68)

For more information aboutSHAC services visit www.pdx.edu/health-counseling.

## Committee for Improving Student Food Security

https://www.pdx.edu/student-access-center/ foodhelp@pdx.edu

Studentfood security is an integral element of a sustainable and equitable Portland State University (PSU) community. The Committee for Improving StudentFood Security (CISFS) seeks to improve PSU students' ability to access affordable, nutritious, culturally relevant food. This will be achieved through fostering community partnerships, increasing awareness, addressing barriers through policy advocacy, and using data to informand build capacity for action.

CISFS provides several services toPSU students, including:
Free Food Market, a monthly dis tribution of free produce and pantry staples

SNAP Application Assistance. We coordinate a calendar of walk-in availability forstudents to ask questions or get as sistance in completing applications for the Supplemental Nutrition Assistance Program

Emergency Meal Vouchers. We provide students with a limited number of meal vouchers for Victor's at Ondine.
PSU Food Share, students can opt-in to receive messaging when there is available leftover food from on-campus catered events.

## Cultural Resource Centers

## Cultural Resource Centers

Smith Memorial Student Union
1825 SW Broadway, Suite 228
Portland, OR 97201
503-725-5351
cultures@pdx.edu
www.pdx.edu/cultural-resource-centers
The Cultural ResourceCenters create a student-centered inclusive environment that enriches the university experience. We provide student leadership, employment, and volunteer opportunities as well as resources such as computer labs, events, lounge/study spaces, and extensive programming. We value diversity, social justice, cultural traditions, student identities, success and leadership. All PSU students are welcome in our spaces!

## La Casa Latina Student Center

Smith Memorial Student Union
1825 SW Broadway, Suite 229
Portland, OR 97201
503-725-6710
www.pdx.edu/cultural-resource-centers/la-casa-latina-student-center

La Cas a Latina Student Center (LCL) is a hub on campus where Latino/a/xstudents and their allies come together to build bridges and connect with community, develop leadership skills, empower their individual and collective identities, and participate in services that support academic success. The mission of the La Cas a Latina Student Center is to attract Latino/a/x students to Portland State University and to providecultural, social, and academic services and programs thatenhance the quality of Latino/a/xstudent life. We seek to raise awareness about the rich diversity of Latino/a/xculture across campus. All PSU students are welcome!

# The Middle Eastern, North African, South Asian (MENASA) Cultural Center 

Smith Memorial Student Union
1825 SW Broadway, Suite 238
Portland, OR 97201
503-725-5342
www.pdx.edu/cultural-resource-centers/middle-east-north-africa-south-asia-initiative
The Middle East, North Africa, South Asia (MENASA) is the sixth Cultural Resource Center at Portland State University. The Initiative to create the center started in 2016 when it was included in the Cultural Resource Centers Five-Year Strategic Plan. This Initiative formally recognizes MENASA students and their allies who are a critical mass in our spaces yet do not have dedicated services. While our other five cultural centers have demographic data to support their mission, the MENASA community does not. This presents a unique challenge in supporting these scholars. Currently, ALMENASA Cultural Center is located and operating fromSMSU room 238, and The MENASA teamis working to come up with the final design and floorplan for room 238 , which will go through its renovation process during the summer of 2022. All students are welcome!

## Multicultural Student Center

Smith MemorialStudent Union
1825 SW Broadway, Suite 228
Portland, OR 97201
503-725-5342
multicultural@pdx.edu
www.pdx.edu/cultural-resource-centers/multicultural-student-center
The Multicultural Student Center provides a space where students can develop cultural competency through student engagement, programming, and meaningful dialogue. Folks can participate in events that explore intersectional identities, including our multiracial, first-generation, and international student populations. Res ources such as student leadership opportunities, a computer lab, and spaces to relax and study are accessible and open to all. Students may also partake in a forumfor collaborative cultural, education, and social experiences at PSU and beyond.

## Native American Student \& Community Center Student Programs

Native American Student and Community Center
710 SW Jackson Street

Portland, Oregon 97201
503-725-9701
www.pdx.edu/cultural-resource-centers/native-american-student-community-center-student-programs
www.pdx.edu/native-american-center/
The NASCCProgram Coordinator is located at the Native American Student and Community Center. Their work includes supporting students in multiple ways. Some of theminclude; student centered-programming, supervision of student employees and confidential advocacy. In addition, their time is spent on PSU-wide committees representing the well-being of Native American, Alaska Native, and Pacific-Islander students. Last, they work collaboratively with the Multicultural Retention Services Retention Coordinator and the NASCCManager to support all students that access any of the cultural res ource centers on campus.

## Pacific Islander, Asian \& Asian American Student Center

Smith Memorial Student Union

1825 SW Broadway, Suite 235
Portland, OR 97201
503-725-9391
www.pdx.edu/cultural-resource-centers/pacific-is landeras ian-asian-american-student-center

The Pacific Is lander, Asian and Asian American (PIAAA) Student Center at Portland State University offers an engaging and accepting s pace to address the diverse and changing needs of our Asian and Pacific Islander student communities.PIAAA streng thens the identity of API students through accessible programming, inter-cultural community building, and social justice education. All students are welcome!

## Pan-African Commons

Smith Memorial Student Union
1825 SW Broadway, Suite 236
Portland, OR 97201
503-725-9371
www.pdx.edu/cultural-resource-centers/pan-africancommons

The Pan-African Commons (PAC) cultivates cultural, personal, academic, and professional development and opportunities through culturally relevant programming and resources that foster empowerment, enrichment, and principled solidarity that advocates liberation among peoples of the African diaspora. PAC seeks to create a welcoming and affirming environment where students can
engage in healing and exploration and celebrate their cultural ways of being. All students are welcome!

## Dean of Student Life

Dean of Student Life
433 Smith Memorial Student Union
503-725-4422
askdos@ pdx.edu
www.pdx.edu/dean-student-life
The physical location of the Office of Student Affairs houses the Dean of Student Life, Student Conduct \& Community Standards, and the CAREProgram.
Collectively, these staff connect students with resources when they are experiencing distress. Students can come to DOSL if they have conduct issues, experience difficulties outside of the classroomaffecting their academic success, would like to get in volved in campus life, or have questions/concerns and don't know with whomto speak.

## Disability Resource Center

Dis ability Resource Center

## Disability Resource Center

116 Smith Memorial Student Union
503-725-4150
drc@pdx.edu
www.pdx.edu/disability-resource-center/
The Dis ability Resource Center (DRC) serves students with all disability types (learning, ADHD, brain injuries, psychological, chronic medical, physical, visual, hearing, autis $m$ /Asperger's, developmental, and others). We provide students with academic or other accommodations, removing or minimizing barriers in the environment so that they have the ability to be successful at PSU. We advocate on behalf of students as necessary in order to ensure other PSU faculty and staff are working toward the same goals in helping the student to the greatestextent possible. We also connect the student with other on-and off-campus resources as needed. Information about dis ability shared with the DRC is kept confidential (except for in extreme situations where sharing the information with emergency pers onnel or others is critical). DRC regis tration status does not become part of any permanentrecords or transcripts. Come visit us in the DRC and learn more!

## Global Diversity and Inclusion

RMNC 830
pdx.edu/diversity
diversity@pdx.edu
Global Diversity and Inclusion

At the intersection of the presidential priorities of racial justice, equitable student success, and deepening community engagement lies a model of a university that represents what the future demands.

The Division of Global Diversity \& Inclusion is the institutional body partnering across campus to ensure the thriving of minoritized communities and the embedding of equity and justice in all campus operations.

## Student Support and Programs

GDI is home to over a dozen resource centers and programs that serve and empower our increasingly diverse student community and leads efforts to advance equitable student success using holistic, asset-based and culturally relevant approaches.
pdx.edu/diversity/student-support-programs

## Equity and Compliance

GDI's Office of Equity and Compliance evaluates and investig ates complaints of prohibited discrimination and haras sment, as sists in addressing systemic concerns based on a protected class, ensures compliance with federal and state laws and regulations, and oversees Title IX, VI, and VII compliance.
pdx.edu/diversity/equity-compliance

## Diversity Education and Learning

GDI develops diversity education offerings addressing a variety of needs and experience levels. Through a combination of theoretical and practical knowledge-based approaches, our overarching goal is to cultivate a culture of praxis (a synergy of theory and practice) that allows us to live and embody diversity and equity-minded practices. pdx.edu/diversity/diversity-education-learning

## Diversity, Equity \& Inclusion Advocacy

GDI cultivates diversity, equity, and inclusion advocacy through the ongoing examination of all endeavors, activities, practices, structures, and systems at PSU. Campus community members are encouraged to join the President's Diversity Action Council to be a part of PSU's collective action to be an equitable campus. pdx.edu/diversity/diversity-advocacy

## Helen Gordon Child Development Center

## Helen Gordon Child Development Center <br> 1609 SW 12th Avenue

503-725-3092
www.pdx.edu/helen-gordon-center/
The Helen Gordon Child DevelopmentCenter is a University-operated service that provides a quality educational laboratory preschool/extended day programfor children 4 months to sixyears of age. The center is accredited by theNational Academy of Early Childhood Programs, a division of the National Association for the Education of Young Children. The center is open from 7:30 a.m. to 5:30 p.m. daily. Children of PSU students,
faculty, and staff are eligible for enrollment in the program. Enrollment is based on the date of application.

As a laboratory preschool/extended day program, the center enables students fromeducation, psychology, and related fields to complete course requirements through observation, practicum, or research activities at the center. Interested students should contact the center's office.

## Information Technology

Information Technology
Fariborz Maseeh Hall (FMH)
1855 SW Broadway
Lobby
503-725-HELP (4357)
www.pdx.e du/oit/
help@pdx.edu
The Office of Information Technology (OIT) provides support for computing, networking, data storage, voice and data communication, multimedia, computer labs, clas srooms, and audiovisual services. All faculty, staff, and students can receive support by calling, emailing, visiting the OIT website, or visiting the Helpdesk in the FMH lobby.

## Learning Center

The Learning Centers strives to foster the learning process by empowering PSU students to accomplish their academic and pers onal goals. To do this, the Learning Center provides a variety of academic support services for students: Academic Coaching, Peer Tutoring, College Success courses, ROADS to Success presentations, Testing Services, and Remote + Online Learning Support. All Learning Center programs are open to undergraduate, postbaccalaureate, and graduate students.

## Academic Coaching

PSU's Learning Center offers a flexible coaching service that allows students to work with coaches in creating meas urable plans to meet their academic goals. These goals may address school/life balance, active learning strategies and various approaches to studying course content, improving communication skills, and learning about resources on and off campus. All academic coaches are matched to an academic pathway. Feel free to view the coaches' bios on our website. To schedule an academic coaching appointment, visit the academic coaching pageon our website, or call 503-725-4448.

## Tutoring Services

The Learning Center provides free peertutoring services in math, sciences, and world languages. The goal of our tutoring programis to promote independence in learning and give students the tools to take control of their learning
process. The Learning Center provides on campus, online, and group tutoring. In addition, we offerLive Streams for selected courses. All tutors are current PSU undergraduate and graduate students that have successfully taken the courses they provide help with. Check out the tutoring page for a complete list of subjects, schedules, and availability.

## College Success Courses

College Success is a comprehensive (3-credit) course designed to enhance academic success by helping students identify barriers that hinder their ability to achieve their academic, personal and/or professional goals. Using guided, reflective journaling as a self-discovery tool, students explore the seven non-cognitive competencies: self-advocacy, confidence, emotional intelligence, resilience, perseverance, self-control, and growth mindset. In addition, College Success offers the opportunity to gain cognitive skills (study strategies) based on principles of learning and thinking, which students are encouraged to integrate and apply in order to become engaged, effective, and empowered learners.
Whether you are new to college, new to PSU (transfer student), or simply in need of a motivation jump start, there is much to gain fromthis course. Lower and upperdivision options available. For more information, or to see the upcoming schedule, see the college success page.

## Remote + Online Learning Support

The Learning Center is the home of Remote and Online Learning Support for all of PSU's students. There are resources to help you navigate how you manage your studies while you take online courses, as well a free course designed to get you more comfortable with the learning management systemthat PSU utilizes.

## Testing Services

Testing Services through the Learning Center provides accommodated testing support for PSU students registered with the Disability Resource Center.

## Learning Resources for Students

In addition to our services, we have a repository of many usefulyet practical works heets, website links, and other helpfultips. This information can be found on the subject resourcepageon our website.

## Little Vikings and Baby Vikings

## Little Vikings

Epler Hall, 1st Floor
503-725-8800
www.pdx.edu/students-with-children/little-vikings

## Baby Vikings

## Smith Memorial Student Union, 1stfloor 503-725-9622 <br> www.pdx.edu/students-with-children/baby-vikings

Little and Baby Vikings provide walk-in, reserved, and occasional care for children. You can reserve care for the entire term, up to 5 hours per day and 20 hours per week. In addition to flexible hourly care, Baby Vikings offers several full-time childcare slots available by reservation only. Little Vikings also provides day camps fordays when Portland Public Schools do nothave school, but classes are still in session at PSU.

## Locker Rental

## LOCKER RENTAL

University BoxOffice
1825 SW Broadway, Suite 120
Smith Memorial Student Union, Broadway lobby 503-725-3307
tickets @ pdx.edu
You don't have to lug that stuff all over campus. Shortterm and long-termgeneral lockers are available for rent year-round through the University Box Office located in Smith Memorial Student Union. The lockers are available in Cramer Hall and Science Building One (SB1). They include convenient built-in combination locks as part of the rentalfee.

## Multicultural Retention Services

Multicultural Retention Services
Smith Memorial Student Union
1825 SW Broadway, Suite 425
Portland, OR 97201
503-725-4457
https://www.pdx.edu/diversity-multicultural-studentservices/

Multicultural Retention Services (MRS) strives to ensure the academic success, retention, and graduation of students through culturally inclusive programs and services that are designed to build a strong sense of community and belonging. We provide academic support, advising, referrals, and advocacy for first generation, low-income, and/orhis torically underrepresented students.
Divers ity Scholarship Program
Smith Memorial Student Union
1825 SW Broadway, Suite 425
Portland, OR 97201
503-725-4457
www.pdx.edu/multicultural-retention-services/dsp
The purpose of the Divers ity Scholarship Program(DSP) is to expand and enrich Portland State's learning community by recognizing and supporting outstanding students fromfirst generation and various cultural, ethnic and socio-economic backgrounds, with diverse talents,
interests, and life experiences. The Diversity Scholarship Programis committed to helping students achieve their academic goals. The programpromotes diversity and student participation in campus life through volunteerism and

Black Student Services
Smith Memorial Student Union
1825 SW Broadway, Suite 425F
Portland, OR 97201
503-725-4457
www.pdx.edu/multicultural-retention-services/
Black Student Services (BSS) provides academic support services, advocacy and campus navigation centering the experiences of the African diaspora. We provide connections to communities of the color within and outside of the diaspora through services and resources for incoming freshman, transfer and continuing students. BSS also provides a supportive and welcoming environment for Black students through social groups such as Empowering Sisterhood and Building Brotherhood as they acclimate to the academic environment or continue their education at Portland State. Black StudentServices assists students who are seeking a cultural connection at Portland State University through community building activities and connecting them to bothPSU student groups and faculty, as these are es sential components to achie ving academic success.

Asian and Pacific Is lander \& Desi Student Services Smith Memorial Student Union
1825 SW Broadway, Suite 425F
Portland, OR 97201
503-725-4457
www.pdx.edu/diversity/student-support-programs
Asian, Pacific Is lander \& Desi (APID) StudentServices supports students in the PSU Community through multicultural advising, engagement, advocacy, and empowerment. We are here for those who seek to build a cultural connection to campus resources, org anizations, and services, including APID Staff, Faculty, and Community. We specifically provide: academic support; opportunities for leadership development; referrals to API community resources; and holistic support for new and continuing students at PSU. APID Student Services welcomes all students who seek resources, support, and a senseof community that will enable them to become successful students and leaders at PSU.

Latino/a/xStudent Services
Smith Memorial Student Union
1825 SW Broadway, Suite 425
Portland, OR 97201
503-725-4457
www.pdx.edu/diversity/student-support-programs
Latino/a/xStudent Services (LSS) provides academic support services, advocacy and connections to campus and

Latino/a/xcommunity services and resources to new incoming freshman, transfer and continuing students. Latino/a/xStudent Services provides a supportive and welcoming environment for Latino/a/xstudents as they transition to the PSU academic environment. Latino/a/x Student Services assists students who are seeking a cultural connection to the Portland State University campus by connecting themto student groups and faculty, an es sential component to achieving academic success.
Native American StudentServices
Native American Student and Community Center 710 SW Jacks on Street
Portland, OR 97201
503-725-5348
www.pdx.edu/multicultural-retention-services/nations
The Native American Student Services Program(NAS) provides support for Native American and Alaskan Native students through general advising, guidance, advocacy and referrals to appropriate campus-based and Portland Metro resources, es pecially org anizations serving Native American people. Native American StudentServices connects students to opportunities for Native American cultural enrichment and social activities, both on campus and in the community.

## Native American Student \& Community Center

Native American Student \& Community Center
PSU Native American Student and Community Center 710 SW (Andrew) Jacks on Street
503-725-9695
nascc@pdx.edu
www.pdx.edu/native-american-center/

The Native American Student \& Community Center (NASCC) is a gathering space to celebrate and empower student success through culturally relevant programming, academic support, and inter-generational community engagement to preserve and perpetuate inter-tribal connection forNative American/Alaskan Native/Pacific Is lander students and our allies through tradition, ceremony, and storytelling.

## Queer Resource Center

Queer Res ource Center 458 Smith Memorial Student Union
503-725-9742
qre@pdx.edu
www.pdx.e du/queer

The Queer Resource Center supports queer and trans students at Portland State University in achieving their educational goals through advocacy, community, and celebration. We prioritize a racial justice framework to improve campus climate through education, policy change, and campus-wide organizing. Our vision is to provide students with the support they need to pers ist to graduation through increasing equity and access for queer and trans students at Portland State University. The QRC hosts social and support hours, creates programming geared toward building and connecting communities, and fosters a welcoming space with a library, computer lab, and lounge.

## Office of the Registrar

1855 SW Broadway, FMH Student-Services Lounge 503-725-3220

## www.pdx.edu/registration

The Registrar's Office provides enrollment, certification, and records management services to students, faculty, staff and the public. Specific areas of service include the following:

- Course Scheduling and Classroom Assignments
- StudentRegistration
- StudentRecords Maintenance
- Academic Transcripts
- Enrollment Verification \& Degree Verification
- Degree Certification and Diploma Distribution
- Degree Audit SystemManagement
- Veteran's Benefits Certification
- Residency Officer
- Transfer Course Articulation (credit evaluation)
- Scholastic Standards Committee petition process support
- Deadline Appeals Committee petition process support
- Academic Requirements Committee petition process support


## Ronald E. McNair Scholars Program

## Ronald E McNair Scholars Program

## 503-725-9740

www.pdx.edu/menair-program/
The PSU McNair Scholars Programworks with selected first-generation, low-income and under-represented undergraduates who want to pursue PhDs. McNair scholars conduct research under the supervision of faculty mentors
and create effective strategies for getting into and graduating fromdoctoral programs.

## Services for Students with Children

## Services for Students with Children 462 Smith Memorial Student Union 1825 SW Broadway <br> Portland, OR 97201 <br> (503) 725-9878 <br> www.pdx.e du/students-with-children

The mission of Services for Students with Children is to support students with children in achieving life-balance that helps themstay the course to successful completion of their academic goals. They offer subsidized child care tuition for eligible students through the JimSells Childcare Program; flexible, by-the-hour childcare on-campus at Little and Baby Vikings; social and informational events, and much more! In addition, they oversee several familyfriendly study rooms and 15 lactation spaces on campus as well as a free children's clothing closet and food pantry. The Res ourceCenter for Students with Children provides support for pregnant and postpartum students through individual consultation, and they actively advocate for student parents to faculty, staff, and administration.

## SHAC Counseling Services

## Uni versity Center Building, Suite 200 <br> 1800 SW 6th Avenue <br> 503-725-2800 <br> www.pdx.e du/health-counseling/counseling

Counseling Services in the Center for Student Health and Counseling (SHAC) offers a variety of services designed to support the emotional well-being of PSU students. Services are provided by a professional staff of licensed psychologists, social workers, counselors, psychiatrists, and doctoral-and master's-level students in training. Services include: initial consultations, brief individual therapy, group therapy and support groups,
emergency/crisis counseling, psychiatric assessment and treatment, referral as sistance, psycho-educational works hops and trainings, and consultation for the campus community. Counseling Services also offers comprehensive learning disability and ADHD evaluations.

## SHAC Dental Services

Uni versity Center Building Suite 307
527 SW Hall Street
503-725-2611
www.pdx.e du/health-counseling/dental
DentalServices in the Center for Student Health and Counseling (SHAC) is staffed by licensed, experienced professionals who provide dental care with the student's health and comfort in mind. PSU students enrolled in one
(1) or more credit hours per termmay access Dental Services on a fee-for-servicebasis. Most fees are billed directly to students' PSU accounts. There is no student dental insurance plan; however, the cost of services is greatly reduced (typically 30-50\%) compared to costs of a private dental clinic. DentalServices's staff will submit claims to all private insurers that allow it. However, DentalServices is not responsible for the determination of benefits. Dentists make referrals to outside specialists if students need specialty care or more intensive dental treatment.
Some of SHAC's dental services include:

- Routine and emergency exams
- Teeth cleaning
- X-rays
- Fillings, crowns, and bridges
- Oral surgery/wis domteeth extraction
- Customwhitening trays
- Night guards and sports guards
- Root canals

For a comprehensive list of services and fees go to www.pdx.e du/heal th-counseling/dental.

## SHAC Health Promotion and Education

## University Center Building, Suite 307 527 S W Hall Street <br> 503-725-5339

## www.pdx.edu/health-counseling/wellness

The focus of Health Promotion and Education rests in comprehensive, community-level interventions aimed to influence the environment in which students live, work, and learn. This work is accomplished through health promotion programs (planned, organized events and activities thatempower students over time to make informed decisions regarding their health); health education (providing health-enhancing learning experiences forfaculty, staff, and students through campus-wide events, works hops, and classes); and environmental approaches (policies and partnerships).
Health Promotion and Education is comprised of:

- Illuminate: An interpersonal violence prevention(IPV) programwhich uses the power of prevention education to promote healthy relationships and sexuality by addressing the underlying social determinants of violence and to createequal and respectful relationships. Illuminate seeks to shed light on the social injustices that lead to sexual and relationship violence and to create social change through prevention
programming such as bystander intervention, antioppression, consent workshops, and campus social norms.
- Wellness \& Health Action Team (WHAT): A group of student peer health educators who take a peer mentor approach to talking about and educating students on a wide variety of wellbeing topics and healthy lifestyle choices.
- Mental Health Promotion: Encompas ses traumainformed trainings for faculty, staff, and students who serve other students, suicide prevention programming and support and advocacy for students in recovery including those involved with the Collegiate Recovery Community student organization.
- The Mind Spa: A private space where students can rest, relax, and unwind at no charge. The Mind Spa contains a light therapy alcove, biofeedback software, an automatic mas sage chair, and other services to help students learn new skills to reduce $s$ tress and an xiety levels. Students can book up to three (3) appointments per term at www.pdx.edu/health-counseling/mind-spa. Additionally, students may access the Virtual Mind Spa Experience whenever needed no matter their location: sites.google.com/pdx.edu/virtual-mindspa/home.


## SHAC Health Services

Uni versity Center Building, Suite 200
1800 SW 6th Avenue
503-725-2800
www.pdx.edu/health-counseling/health
Health Services in the Center for Student Health and Counseling (SHAC) is staffed by board-certified healthcare providers, certified physician assistants and nurse practitioners, registered nurses (RNs), and allied health professionals who are available for diagnosis, treatment, consultation, and referrals for illness and injury. Health Services offers a range of primary care services including screenings for sexually transmitted infections (STIs), diagnostic laboratory work, pap and pelvic exams, family planning counseling and contraception, $x$-ray, immunizations, and student travel consultation. Health Services offers hormonereplacement therapy (HRT) and trans medical services. Health Services has RNs who are trained and licensed to provideexaminations and support for sexual ass ault survivors.

If a student has a health question or concern and Health Services is closed, students can access a 24/7 External Nurse AdviceLine at 1-844-224-3145.

## Smith Memorial Student Union

## Smith Memorial Student Union 1825 SW Broadway St. <br> 503-725-2663

## smsu@pdx.edu <br> www.pdx.edu/student-union

Smith is the living room of Portland State's downtown campus. Its resource centers, retail outlets and meeting spaces bring together students, faculty and the community. In the corridors of Smith, you'll find amenities such as Smith's Kitchen food court, the University Market with its snacks and supplies and the Smith's Place coffee shop. In the basement of Smith you can hang out at the Viking Gameroom, which features pooltables, video gaming, Foosball and the s mallest public bowling alley in Oregon.

Be inspired by Smith's student-run art galleries, relax or study in the lounge spaces or find your people in the many cultural centers. Studentres ources such as the Dean of Student Life's Office, Student Legal Aid, Queer Resource Center, Women's Resource Center, Veterans Resource Center, Resources for Students with Children and TRIO support are under Smith's roof. It's also home to PSU student media, the student leadership programs (never too late to join!), campus meeting spaces and more.

Smith is unlike any other facility on campus. Come by and find out why you belong here.

## UNIVERSITY BOX OFFICE

University Box Office
1825 SW Broadway
Suite 120 -- Smith Memorial Student Union
Broadway lobby
503-725-3307

The University Box Office at Portland State is the place to get event tickets, campus information and locker rentals (see also Locker Rentals). Thebox office sells and dis tributes tickets for university and external events held at Portland State venues. This makes it your starting point for attending Lincoln Hall performances, Viking Athletics events, commencement ceremonies, student-organized functions and cultural events. The Broadway lobby office in Smith also serves as the PSU Information Desk. If you can't stopby, you can purchase tickets online at https://portlandstate.universitytickets.com/

## VIKING PAVILION AT THE PETER W.STOTT CENTER

Viking Pavilion at the PeterW. Stott Center 930 SW Hall Street
503-725-2663
conferences@pdx.edu
www.pdx.edu/conferences/viking-pavilion-peter-w-stottcenter

Most PSU students know Viking Pavilion is the home of Viking Women's Volleyball and Men's and Women's Basketball, but the 3,000-seat arena also hosts orientations,
commencements and student events for the entire campus community. Regional corporate partners such as OHSU, TechFestNW and Nike often use Viking Pavilion to host company evenings, banquets, trade shows and conferences. Weekdays, Viking Pavilion offers a cafe, student seating space and classrooms. It's a contemporary, spacious facility for use by students and athletes alike.

## VIKING GAMEROOM (BOWLING ALLEY)

Viking Gameroom
1825 SW Broadway
Basement of Smith Memorial Student Union 503-725-4529
gameroom@pdx.edu
www.pdx.edu/student-union/viking-gameroom
Yes, Portland Statehas a bowling alley, pool tables and gaming space in the heart of the campus. The Viking Gameroom, located in the basement of Smith Memorial Student Union, offers six bowling lanes available for open play and reservations. It's a great place to have a birthday, celebration or friendly tournament. It's available to students, staff and the general public -- and features its own fully-stocked concession stand. Don't bowl much? Drop by for free popcorn Fridays with a valid PSU ID.

## Student Activities and Leadership Programs

## Student Activities and Leadership Programs Smith Memorial Student Union Suite M113 <br> 1825 SW Broadway <br> Portland, OR 97201 <br> 503-725-4452

## asksalp@ pdx.edu

www.pdx.edu/student-leadership/
Student Activities and Leadership Programs' mis sion is to enrich and integratestudents' leadership and academic experiences in order to educate students to beethical, socially just, and civically eng aged leaders on campus and in their larger communities. The following programs are supported by SALP:
Portland State Programming Board
Suite M110
1825 SW Broadway
Portland, Oregon 97201
(503) 725-5638
pdxprogramming @ gmail.com
www.pdx.e du/student-leadership/portland-state-programming-board
Portland State Programming Board promotes community, pride and tradition through student-initiated cross-campus events. PSPB plans free events toenhance the experience of all PSU students' campus life experiences such as the annual Portland State of Mind Concert, quarterly Midnight

Breakfast and Mid-TermStress Relief, and weekly
Parkway North Project series including movies, concerts, and other fun activities.

## Student Government-ASPSU

Smith Memorial Student Union Suite 117
1825 SW Broadway
Portland, Oregon 97201
(503) 725-8973
aspsu@pdx.edu

## www.pdx.edu/student-government

Greetings fromthe As sociated Students of Portland State University! We serve as your Student Government, representing 27,000 students. The is sues in which we constantly lobby for are lower tuition, lower fees, cultural competency and a safe campus for all. We aim to advocate for and represent the interestof students before internal and external bodies; facilitate formal needs of communication and interaction between students, student org anizations, faculty and University administration; identify and develop services not offered by other divisions of the University; and provide a process for students to fully participate in the allocation of student incidental fees.
Student Community Engagement Center Smith Memorial Student Union
Suite M102/103
1825 SW Broadway
Portland, Oregon 97201
(503) 725-8132
volunteer@pdx.edu
www.pdx.edu/student-community-engagement
The Student Community Eng agement Center is the hub for student civic engagement at Portland State University. Through meaningful service opportunities ranging from one-day service events to year-long service commitments, we strive to provide robust and varied co-curricular opportunities for all students at Portland State to engage with the community and become catalysts for change. If you are looking to volunteer, fulfill hours for a class, explore something you are passionate about, and/or make connections and explore Portland, reach out and we'll help you find an opportunity that matches your interest and schedule!

## Student Media

Smith Memorial Student Union
Sub-basement
1825 SW Broadway
Portland, Oregon 97201
(503) 725-5687
smedia@pdx.edu

## www.pdx.edu/student-media

Student Media is the home forPortland State's officially recognized student-run media organizations. Our aim is to provide a learning laboratory to develop skilled, ethical media creators and future professionals who serve the PSU community by adding to its intellectual and cultural vibrancy. We have an array of roles for students interested in such areas as journalism, photography, video, audio, graphic design, creative writing, web development, and marketing.

Student Operated Services<br>Smith Memorial Student Union Suite M113<br>1825 SW Broadway<br>Portland, Oregon 97201<br>(503) 725-4452<br>asksalp@pdx.edu

www.pdx.edu/student-leadership/get-involved\#s os

The Student Operated Services provide critical services to the student, campus, and broader community while serving as an avenue for student employees to develop professional and leadership skills, some of which have been around for several decades. The five services are: 5th A venue
Cinema, Graphic Design Center, Littman + White Galleries, Portland State Professional Sound, and PSU Food Pantry.

## Student Organizations

Smith Memorial Student Union
Suite M113
1825 SW Broadway
Portland, Oregon 97201
(503) 725-4452

## asksalp@pdx.edu

uww.pdx.e du/student-leadership/get-
involved\#studentorg
SALP is home to close to 200 different student org anizations with new groups forming each year. Each studentorganization has a leadership teamthat works closely with SALP Student Organization Advisors to accomplish their group goals and grow as student leaders. If you are interested in joining a PSU student organization or starting your own, please vis it PSU Connect (pdx.edu/connect), the SALP Clubhouse (Smith Memorial Student Union room 113M), or review the following
webpage for more information: www.pdx.edu/student-leadership/join-or-start-student-organization.

## Student Sustainability Center

## Smith Memorial Student Union Suite M104/103 <br> 1825 SW Broadway <br> Portland, Oregon 97201 <br> (503) 725-5598

## psussc@pdx.edu

www.pdx.edu/student-sustainability-center

Explore sustainability, build community, and strengthen your res ume. Our programs, services, and activities are designed for students who want to create positive change in their own lives, on campus, and beyond. Choose your own adventure and thrive!

## Student Ambassador Program

## Student Ambassador Program

## www.pdx.edu/visit/meet-student-ambas sador

The mission of the Student Ambassador Programis to promote Portland State University. We represent the student experience to current and future students and their families. We promote our diverse Portland State community to guests, adminis trators, faculty, staff, alumni, community partners, dignitaries, and friends of the University.
Student Ambassadors are students first and must be able to balance their academics with the demands of the program. The primary purpose of the programis to provide a leadership laboratory through which Student Ambas sadors enhance and supplement their academic, communication, time management, and other professional skills.

## Student Financial Aid and Scholarships

Office of Student Financial Aid and Scholarships 503.725.3461
www.pdx.edu/student-finance

The Office of Student Financial Aid and Scholarships as sists students, parents and families in applying for aid from federal, state and university program
sources. Financial aid advisors are available to assist students and their families with any questions they may have, to help themunderstand the financial aid programs available, and to guide them through the application process.

## Student Legal Services

Student Legal Services
Smith Memorial Student Union Suite M343
1825 SW Broadway
Portland, OR 97201
503-725-4556

## https ://www.pdx.edu/student-legal-services/

StudentLegal Services (SLS) provides free confidential legal consultations and representation toPSU students taking one or more undergraduate or graduatecredits and paying student fees. SLS handles a wide range of legal is sues including: landlord/tenant, immigration, family law, car/bike accidents, bankruptcy, consumer, debtor/creditor, criminal, criminal expungement, employment, interpersonal violence, name/gender change, and traffic citations. SLS also provides notary services, internships, and Explore the Law, a programfor students interested in legal professions.

## Transportation and Parking Services

1812 SW 6th Ave, in the Academic \& Student Recreation Center (ASRC)
503-725-3442
www.pdx.edu/transportation
Whether you travel by bike, bus, car, train, skateboard or your own two legs, our mission is the same: Get you where you need to go on campus in the most efficient, affordable, and sustainable manner possible.
PSU has three light-rail lines, two streetcar lines and over 20 bus routes converging on campus, soit should come as no surprise that public transit is the most popular and convenient option for students. Our Student Viking Pass, allows full use of the TriMet systemat a $50 \%$ discount. Many students also qualify forTriMet's ReducedFare program, which provides an even better $72 \%$ discount. Contact our office for information about signing up!
PSU is also an award-winning bicycle friendly campus. Bicycle racks are available outside allbuildings on campus as a convenient, short-termparking option. PSU also provides a variety of indoor bike parking facilities, which allow you to park your bike in a space that's safe and dry. Best of all, you can keep your bike running smoothly with
a visit to the PSU Bike Hub, an on-campus bike shop at the StudentRec Center. Students can rent or buy a bike, drop off a bike for profes sional repair or learn to service it themselves, and receive discounts on a wide selection of merchandise.

Need a car once in a while, but don't want the hassle of bringing one with you? Zipcar, Portland's largest cars haring company, has over 20 vehicles available in the univers ity district. PSU students and employees can join this service at a discount.

Parking on campus is very limited. For those who need to drive to campus, a variety of parking permits are available by the academic termand the academic year. Parking permits should be purchased in advance, prior to the term start, as they frequently sell out. Permits can be purchased online at pdx.edu/transportation approximately 4 weeks before the start of each term. Permits purchased online are sent by mail or held at will call. Daily and hourly parking is also available for those who prefer to drive infrequently.

If you have any questions, please call Transportation \& Parking Services at 503-725-3442 or
visit www.pdx.edu/tran sportation.

## TRIO Educational Talent Search

## 1825 SW Broadway, M330

503-725-4458
www.pdx.edu/ubets
Educational Talent Search is a college access program sponsored by Portland State University, and funded through the U.S. Department of Education. Talent Search serves 662 students fromgrades $6-12$ in the Portland SchoolDistrict. The programmission is to identify, motivate, and assiststudents in theireducational transitions into college. We primarily work with students who come from low-income families and/or will be the first in their family to pursue post-secondary education. We encourage students to stay in school and graduate, and to enroll in a community college, a four-year university, or a vocational/technical college.

## TRIO - Student Support Services (SSS)

TRIO - Student Support Services (SSS) programs
TRIO - Student Support Services (SSS) "Classic"
Smith Memorial Student UnionSuite 425
1825 SW Broadway Portland, OR 97201 ph:503-7253815
https://www.pdx.edu/trio-student-support-services/ triosss@pdx.edu

TRIO - Student Support Services "Classic" is Portland State University's federally funded academic and personal support services for college students. It is designed to provide special assistance to those who have traditionally had limited access to a college education. Specifically, students who are low-income, who have a dis ability, or whose parents did not graduate with a bachelor's degree can receive assistance fromSSS if they have a need for academic support. The programprovides academic counseling, financial literacy, scholarship assistance, skill development workshops, study spaces, computer lab, free tutoring, career guidance, and referrals that are designed to help the students achieve their educational goals.

## TRIO - Student Support Services (SSS) "STEM"

Smith Memorial Student Union Suite 425
1825 SW Broadway Portland, OR 97201 ph: 503-7253815
https://www.pdx.edu/trio-student-support-services/
triosss@pdx.edu

TRIO - Student Support Services "STEM" is Portland State University's federally funded academic and personal support services for college students who are majoring in Science, Technology, Engineering, and Math. It is designed to provide special as sistance to those who have traditionally had limited access to a college education in the STEM fields. Specifically, students who are lowincome, who have a dis ability, or who se parents did not graduate with a bachelor's degree can receive as sistance from SSS STEM if they have a need for academic support. The programprovides academic counseling, financial literacy, scholarship assistance, skill development works hops, study spaces, computer lab, free tutoring, career guid ance and referrals that are designed to help the students achieve theireducational goals.

## TRiO Upward Bound

## 1825 SW Broadway, M330

503-725-4458
www.pdx.e du/ubets
Upward Bound, a college preparation programforhigh school students, has been hosted at Portland State University since 1980. Funded by the U.S. Department of Education, Upward Bound is a year-round program designed toimprove students' academic and study skills in high school, to develop their career and educational plans, and to help thementer and succeed in highereducation. Upward Bound serves low income, first generation high school students from the following school neighborhoods: Franklin, Jeffers on, McDaniel, and Roosevelt.

University Market<br>university market

University Market in Smith
1825 SW Broadway, Suite 105
Smith Memorial Student Union, ground floor
503-725-4535
market@pdx.edu
Snacks, drinks, coffee, grab-and-go lunch, everyday supplies and PSU gear can be found in one on-campus location -- the Univers ity Market in Smith. The Market offers regular specials, friendly service and accepts cash, Vis a, MasterCard and Apple Pay. Open weekdays and Saturdays.

## University Welcome Center

University Welcome Center
Academic Student and Recreation Center
Suite 101
1800 SW 6th Avenue
503-725-5555
campus visits @pdx.edu
www.pdx.edu/visit/

The Univers ity Welcome Center (UWC) is the space where the Office of Undergraduate Admis sion and Campus Visits welcomes pros pective students and the community to Portland State University. The UWC is where the Admis sions and Campus Vis its office receives visitors who drop-in to meet with admis sion counselors and for campus tours, information sessions, and admission events.

## University Housing \& Residence Life

University Housing \& Residence Life
The Broadway Building
Suite 210
625 SW Jackson Street
Portland, OR 97201
503-725-4375
housing @pdx.edu
www.pdx.edu/housing
University Housing and Residence Life (UHRL) provides PSU students with on-campus access to safe, convenient, student centered, and supportive living options. Our mission is PSU student success. Consequently, students who choose to live with us receive access to directs taff interaction and support, academic success programs and coaching, facilities support, and hassle-free billing directly to the student's account. The UHRLMain Office provides information about on-campus housing, housing applications and contracts, building maintenance, and housing charges for prospective and currentresidents. Students who choose to live on campus make that choice
because on-campus living leads to student success, on time graduation, and an experience with memories to last a lifetime.

## Veterans Resource Center

Veterans Resource Center

## Veterans ResourceCenter Smith Memorial Student Union Suite 018 <br> 503.725.9807 <br> psuvrc@pdx.edu <br> www.pdx.edu/veterans-resource-center/

The mission of the Veterans Resource Center (VRC) is to as sist andempower our military-connected students and their families. We provide an encouraging community, professional development, VA benefits counseling (via VSOC), academic support, and a safe space for students to relax, network, and connect. We advocate on behalf of our students with PSU staff, faculty, and administrators to increase awareness of the unique cultural differences and experiences found in the Veteran community. The vision of the VRC is to build an equitable and holistic support systemfor students to s mooth their transition to higher education, facilitate academic success, and provide professional and personal development opportunities. We strive to cultivate an environment that is inclusive and engaging for all students, and that celebrates their diversity and intersectional identities.

## Women's Resource Center

## Women's Resource Center <br> 439 Smith Memorial Student Union 1825 SW Broadway <br> 503-725-5672 <br> wre@pdx.edu

## www.pdx.e du/womens -res ource-center

The Portland State University Women's Resource Center offers students of all genders a place for support, leadership development, and community building. Our Sexual \& Relationship Violence Response Program provides confidential advocacy forstudents experiencing stalking, sexualharassment, sexual as sault, and dating/domestic violence. Our Leadership Programoffers unpaid engagement for students who want to develop their personal, professional, and academic skills through a framework of feminist theory and practice. Our events and programs offer the PSU community a place to engage with ideas and celebrateshared identities. We have a lounge space for studying and hanging out with comfortable
seating, a kitchenette, and teaand coffee. We also offer menstrual products free of charge.

## STUDENT POLICIES AND GUIDELINES

## Reasonable Accommodation/Access Policy

PSU students with disabilities are provided with reasonable accommodations that give themthe opportunity for equal access to educational programs, activities, and university life. Prospectivestudents are provided with reasonable accommodations to assist themin the application process.
The Disability Resource Center (DRC) works to ensure equal access to University courses, programs, facilities, services, and activities by providing students with documented dis abilities reasonable accommodations, academic adjus tments, auxiliary aids and services, training, consultation, and technical as sistance.

## Creating a Culture of Respect Module

All PSU employees, including studentemployees, must complete the training module "Creating a Culture of Respect: Preventing Prohibited Discrimination and UnlawfulHarass ment." PSU strives to maintain a climate that values diversity and exemplifies mutual respect. To that end, you are required to complete this module in the first two weeks of employment. Your supervisor can assist you with any questions.
This training offers strategies for preventing unlawful discrimination, harassment, and retaliation within the University. It teaches our community how to respond appropriately when they become aware of potential discrimination or harassment, educates us about the risk of liability to Portland StateUniversity, its managers, and individual employees, and, in keeping with PSU's core values; promotes a climate of mutual respect.

## Safe Campus Module

## Safe Campus Module www.pdx.edu/sexual-assault

Portland State University desires to create a safe campus for our students. As part of that mission, PSU requires all students to take the learning module entitled Creating a Safe Campus: Preventing Gender Discrimination, Sexual Haras sment, Sexual Misconduct and Sexual As sault.

Find the module in D2L. The module and accompanying exam will take approximately 30 minutes to complete. At the conclusion of the module, students should be aware of internal and external res ources, reporting options, and PSU's policies and codes reg arding gender dis crimination, sexual harassment, sexual mis conduct, sexual as sault, dating violence and domestic violence.

## Student Conduct

The Student Conduct and Community Standards Programadministers policies and regulations that help the University to operate in a climate of free inquiry and expression, and supports the academic and educational purposes of the University. Students should seek ass is tance from the Student Conduct and Community Standards Programfor policy information, and with concerns about potential student misconduct, as well as when they are charged with a violation of the Code.

## Academic Integrity

The policy governing academic integrity is part of the Code of Student Conduct and Res ponsibility. Academic integrity is a cornerstone of any meaningful education and a reflection of each student's maturity and integrity. The Code of Student Conduct and Res ponsibility, which applies to all students, prohibits all forms of academic mis conduct, fraud, and dishonesty. Theseacts include, but are not limited to:plagiarism, buying and selling of course assignments and research papers, performing academic as signments (including tests and examinations) for other persons, unauthorized collaboration, disclosure and receipt of academic information, and other practices commonly understood to be academic mis conduct.

## Student Health Insurance

Domestic students enrolled in five (5) or more in-load credit hours per term, or international students enrolled in one (1) credit hour, are required to carry major medical health insurance while attending PSU. Students are as sessed a quarterly health insurance fee that enrolls them in the PSU Student Health Insurance Plan. A student may waive out of the PSU-spon sored health insurance plan if they maintain personal health insurance that meets University criteria. For more information about the PSU studenthealth insurance waiver process, waiver deadlines, or to review the benefits and rules of the PSU Student Health Insurance Plan, vis it https://www.pdx.edu/healthcounseling/insurance.

## OFFICE OF INTERNATIONAL AFFAIRS

## www.pdx.edu/global-engagement

Karl Miller Center, 6th floor

503-725-4094, ogei@pdx.edu

Executive Director: Ron L. Witczak

Deputy Executive Director:Sally S.Mudiamu

On July 1, 2021 the Office of International Affairs (OIA) and the Intensive English Language Program(IELP) merged to form one unit: the Office of Global Engagement and Innovation (OGEI).

Our office actively participates in PSU's mission to internationalize our campus by engaging in, and supporting, dy namic and wide-ranging partnerships. We bring the world and Portland State University together by serving our international students, scholars, and faculty, as well as our U.S. students and faculty studying, interning and teaching abroad. By engaging in innovative partnerships, we provide opportunities for our students to become global citizens, and to raise Portland State University's growing capacity to excelas a globallyrecognized institution.

## Education Abroad

## www.pdx.edu/education-abroad/

Karl Miller Center, 6th Floor 503-725-4095, edabroad@ pdx.edu

## Director: Jen Hamlow

PSU supports the long-standing value that studying other cultures and places is an es sential component of modern education and experience navigating new cultures provides students with marketable career skills. As a result of our commitment to internationalization, the Office of International Affairs sponsors a wide variety of education abroad programs for PSU students year-round, including virtual programming. The University administers some of these programs directly via faculty led programming or direct exchange, while others are conducted in cooperation with educational as sociations such as University Studies Abroad Consortium(USAC), IE3 Global, and the Council on International Educational Exchange (CIEE).
Advisors in Education Abroad provide guidance and assistance for students who seek to enrich their university
education through education abroad. PSU offers over 200 programs in more than 80 countries. Because these programs offer residence credit and home campus regis tration, participating students who are eligible for financial aid at PSU may apply it, in most cases, to these study programs.
PSU Ed Abroad also has a long-standing tradition of working with PSU faculty to develop a variety of shortterm overseas experiences for students. The length of these programs ranges fromten days to sixweeks, and they are offered throughout the academic year. PSU faculty members have taken students to countries all over the world, including China, CostaRica, Cuba, Ecuador, Ghana, India, Italy, Japan, Mexico, Nicaragua, Spain, and Vietnam.
Education Abroad opportunities are subject to change throughout the year. For the mostcurrent listing of programs available and to learn how to get started, please visit our website at www.pdx.edu/education-abroad/, or come to our offices on the 6th floor of the KarlMiller Center.

## Fulbright, Boren \& Critical Language Scholarships

## https://www.pdx.edu/fellowships/

Karl Miller Center, Suite 610
fellowships @ pdx.edu

## Director: Debra Z. Clemans

## Assistant: Karin Waller

## Fulbright Program

Portland State participates in the Fulbright Program, first founded in 1946 by Senator J. William Fulbright and expanded in 1961 as the Fulbright-Hays Act. Awards available include those offered by the U.S. government, foreign governments, universities, and private donors, and most are managed by IIE, the Institute of International Education. Grants are available to qualified US undergraduate and graduate students and alumni for teaching or advanced research, to qualified faculty for lecturing and research, and to teachers for overseas teacher programs. Non-US citizens also have opportunities through Fulbright.

Grants for US students to Study, Research, or Teach Abroad - Fulbright opportunities for US students are
announced annually on April 1 with submis sion deadlines in late Summer/early Fall. The annual campus deadline is September 8 for awards in the US student programthat begin the following academic year. Information sessions are held in Spring term. The director manages PSU's campus interview process and as sists applicants throughout the application cycle. https://us.fulbrightonline.org/
University Lecturing and/or Advanced Research - The application deadline for many faculty and professional level programs is late summer each year. This program also sends non-US scholars and researchers fromoverseas universities to the US. Vis it https://www.cies.org/or contactDebra Clemans to learn about how to in vite a scholar fromoverseas to study, teach, or do research in your department at Portland State University.

Doctoral Dissertation Research Abroad - This FulbrightHays programprovides grants to colleges and universities to fund individual doctorals tudents who conduct research in other countries, in modern foreign languages and area studies for periods of six to twelve months. Deadlines vary. Vis it http://www2.ed.gov/programs/iegpsddrap/index.html and contactDebra Clemans at clemansd@pdx.edu if you decide to apply.

Fulbright for Foreign Students -Fulbright offers awards to students fromoutside the US through embassies and Fulbright commis sions overseas. To learn more about this program, vis it this site:https://foreign.fulbrightonline.org/ Typically the student should be applying while still living in their home country.

## David L. Boren Scholarships (NSEP)

Scholarships to undergraduate and graduate students are available through this federally funded programfor the purpose of helping more Americans learn the languages and cultures of countries and regions deemed critical to U.S. national security and is managed by IIE, the Institute of International Education. It aims to build a base of future leaders and professionals who can help the United States make sound decisions, deal effectively with global is sues, and to enhance and increase the faculty whocan educate U.S. citizens toward achievement of these goals. This scholarship includes a service requirement once a student has completed their degree. Applications are due early in winter term each year. Interviews are held on the PSU campus prior to Boren deadlines. For more information about requirements and application details visit https://borenawards.org/. Information sessions are available during fall term. Those interested should email fellowships @pdx.edu.

## Critical Language Scholarship (CLS)

The Critical Language Scholarship (CLS) is a program managed by American Councils for International

Education that sends current and recent US students (graduate and undergraduate) to other countries as a cohort for immers ive summer programs that focus on languages considered critical to US National Security. This fully funded summer programhas early November deadlines each year for programs that typically begin in June. Debra Clemans offers info sessions about this programin early Fall. See the site for more info:
https://www.clscholarship.org/.

## Institute for Asian Studies

www.pdx.e du/asian-studies
Karl Miller Center, 6th Floor

## 503-725-8575, asianstudies@pdx.edu

Director: Suwako Watanabe

The mis sion of the Institute for Asian Studies (IAS) is to promote understanding of the landscapes, histories, cultures, politics, and peoples of Asia. The IAS leverages the energy and expertise of PSU faculty with deep-rooted and wide-ranging interests in Asia to support research and education about Asia. IAS serves as the center for Asiarelated research, teaching, and outreach in Portland and the wider region through academic and cultural programs.

Founded in 1997, IAS provides programming related to Asia including lecture events of both academic and practical nature and cultural events covering a wide range of regional focuses and is sues through networking and collaborations with the institutional units and community organizations.

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*** Redirect Link ***
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*** Intensive-English-Language-Program ***

## International Partnerships

www.pdx.e du/international-partnerships/

## Karl Miller Center, 630D

503-725-5726, strand@pdx.edu
Director: Sally S. Mudiamu, Ed.D.

The Office of International Partnerships (OIP) is the focal point for all Portland State University international partnerships. PSU is committed to developing robust, multi-faceted partnerships that include transfer \& pathway programs, study abroad at PSU, short-termspecial
programs, education abroad forPSU students, collaborative online international learning, alumni involvement, private sector engagements, and scholarly exchange. Linking these opportunities together under the umbrella of a single comprehensive partnership facilitates a rich international experience for PSU students and faculty. OIP manages 293 partnerships in 54 countries and serves as a bridge to connect PSU faculty and staff to international opportunities. OIP also provides robust cultural and institutional expertise toPSU faculty, staff, and international partners seeking to navigate the complex international university landscape.

## International Special Programs

## www.pdx.edu/intl-special-programs

## Karl Miller Center,Suite 630A

615 SW Harrison

## 503-725-2670, isp.programs @ pdx.edu

## Director: Karin Tittelbach

International Special Programs (ISP) provides non-credit short-term training andeducation programs for profes sional and student groups, custom-designed for specific international org anizations/agencies/institutions, which draw on resources and expertise of PSU faculty and the Portland community to provide specialized instruction.
ISP provides adminis trative, logistical, and curricular support services to provide for a custom-designed group package experience which includes instruction, extra-/cocurricular activities, transportation, housing and meals. ISP hosts 30-35 groups a year. For more information visit our website at www.pdx.edu/intl-special-programs.

## International Student and Scholar Services

## www.pdx.edu/international-students/

www.pdx.edu/international-scholars/
Karl Miller Center, Suite 660
University Center Building, Suite 401
503-725-4094,intl-services@ pdx.edu

## Director: Christina Luther

Associate Director: JillTownley
Assistant Director: Joshua Davis
Assistant Director: Michele Miller
International Student and Scholar Services staff work with admitted language programs and matriculated international students, visiting scholars, and international faculty. The office provides immigration, life and some academic (language programonly) advising to international students as well as providing support to host departments and visiting faculty and scholars. Thestaff work closely with U.S. government agencies, foreign government sponsoring agencies, diplomatic missions, and others to ensure institutional compliance while helping to resolve academic, financial, immigration and adjustment is sues.

Services and programs offered to international students, scholars and faculty include:

- Intensive orientation programs for all incoming international students and faculty.
- Immigration advising for international students, visiting scholars, and faculty.
- Administration of scholarships specifically for international students.
- Educational and social events for international students and scholars with University and community groups, including a mentoring program which matches new international students with returning students to facilitatea sense of belonging.
- Weekly or quarterly workshops on issues affecting international students, such as employment, taxes, cultural adjustment issues etc.
- A weekly International Coffee Hour open to all PSU students, staff, and faculty.
- Advising for PSU faculty and staff regarding the invitation andemployment of international faculty.
- Advising of international scholars and faculty (and their dependents) on regulations and procedures for maintaining legal status, travel, employment authorization, and other is sues.
Formore information aboutstaff and services, please visit ourwebsites:
www.pdx.edu/international-students
www.pdx.edu/international-scholars
For information about international student admis sions, contact the Office of Admis sions at 503-725-3511 or intladm@pdx.edu.

For information about English as a Second Language (ESL) offerings, contact the Intensive EnglishLanguage Program, University Center Building Suite 400, 503-7254088 or es1@pdx.eduorvisit their website at www.pdx.edu/english-language-programs/

## Middle East Studies Center

www.pdx.edu/middle-east-studies

## Karl Miller Center, 660R <br> 615 S W Harrison, Suite 660

## 503-725-4074

## Director: Linds ay Benstead, Ph.D.

Outreach \& Program Coordinator: Corinne Hughes

The mission of the Middle EastStudies Center (MESC) is to serve our students, city, and world through thecreation of a diverse, inclusive community and the promotion and sharing of scholarship on the Middle East, North Africa, and Southwest Asia. The Center was created in 1959 as one of the first two federally supported undergraduate programfor Arabic language and Middle East area studies in the nation. Over the years, the university expanded to offer courses and programs in the four major Middle Eastern languages including Persian, Arabic, Hebrew, and Turkish and programs across different academic disciplines such as International and Global Studies, Political Science, Sociology, History, and Business.

Middle East studies at Portland State boasts a distinguished faculty and vast library resources. The Center serves as a res ourceon is sues pertaining to the Middle East through activities that reach students and scholars, as well as bus inesses, educators, and the media. In addition, the Center supports academic conferences, workshops, cultural events, and lectures and provides supportto area elementary and high school teachers and community college instructors.
The Center's core responsibilities are to coordinate and promote academic and outreach activities across the univers ity and beyond, including conferences, speakers, and training programs for area students, teachers, faculty, and community members. The Center further seeks to guide and train students who plan to make a career in this field. To support these initiatives, MESC closely works
with academic and administrative units across campus. As an outgrowth of these core responsibilities, it also conducts outreach activities with local, national, and international educational and community organizations.
Middle East-related degree programs at PSU include:
-Certificate in Middle East Studies
-Certificate in Global Studies
-Major or Minor in Middle East Language with programs in Arabic, Persian, andHebrew.*

Please take a look at the various activities of ourcenter on our web page and consider becoming a friend of MESC.

* PSU does not currently offer Turkish languagecourses or the Minor in Turkish. Turkish literature courses may be available.


## Portland Center

www.pdx.e du/portland-center/
Karl Miller Center, Suite 630D
503-725-5728, portlandcenter @pdx.edu
Director: Sally S. Mudiamu

In Fall 2018, the Office of International Affairs launched the Portland Center to run programming and support for visiting, non-deg ree seeking international students at PSU. The Portland Center collaborates closely with the Intensive English Language Institute to offer language and academic support to students frompartner institutions wishing to take regular PSU undergraduate classes as part of their home baccalaureate degree. The programaccepts students fourtimes peryear on a rolling admis sions basis and assist students with housing, registration and student support. The W aseda Transnational Program, which has been running for nearly two decades at PSU, has been folded into the PortlandCenter. Sally Mudiamu will serve as Director, and the Portland Center will be housed in the Office of International Partnerships. The Office of International Affairs is excited about offering this opportunity to ins titutional partners and their students. It will offer PSU an opportunity to more intentionally meet the needs of short-term visiting international students while simultaneously offering an opportunity to advance the internationalization of the PSU undergraduate curriculum by working collaboratively across units and schools to offer programming that showcases Portland.

## UNIVERSITY LIBRARY

## Michael Bowman, Interim Dean <br> 503-725-5874 <br> library.pdx.edu

The University Library supports students with online and print resources, a variety of study spaces and technology, and research help and instruction. The electronic collections, available at the Library's website, include thousands of academic res ources like journals, books, streaming media, and databases, available online on- and off-campus. The Branford Price Millar Library, located on the west side of the SouthPark Blocks next to the Viking Pavilion, houses a large collection of books, journals, DVDs, and more. Students will find comfortable study spaces, tables for group work, computer labs, and quiet floors. The Library also loans technology like laptops, iPads, and calculators. Special Collections and University Archives feature unique materials of regional and scholarly interest. PDXScholar, the university's digital repository, includes PSU theses, dis sertations, open access textbooks, and student and faculty scholarly contributions.
Librarians teach classes and works hops on library information and resources. Faculty can use the websiteto request an instruction session for their class.
The Library encourages students to ask for help with research. Vis it the Library Reference Desk on the Library's second floor, call503-725-2399, or contactus by chat, text, or email. Subject librarians are available to consult with faculty and students on in-depth research questions, theses, and dissertations.

Tutoring is available on the second floor at the Writing CenterOutpost (weekday mornings) and the Learning Center.
To check out materials, visit the Circulation desk on the first floor. A valid PSU ID is required. More information about borrowing materials, loan periods, fines, and renewals is available online.
Course reserves materials may be checked out at the Circulation desk on the first floor. Online course reserves are available via the Library's website.
The Library provides collaborative study spaces and technology-enabled environments designed to enhance students' learning experiences. Group study rooms, three practice presentation rooms, and a family friendly study room are available. They can be reserved in advance online. Keys may be picked up at the Circulation desk. The Library also provides designated quiet study floors for individual study.
Food and drinks are allowed.

The Library's hours vary throughout the year. Visit the Library's website or call 503-725-5874 forcurrent hours.

# UNIVERSITY STUDIES 

117 Cramer Hall
503-725-5890
www.pdx.edu/unst
askunst@pdx.edu
Please see University Studies (general education) baccalaureate requirements (p.32).
The faculty of PSU have designed a four-year programof study required of all students (not required for Liberal Studies or Honors Program) planning to graduate from PSU. This nationally recognized programoffers students a clear opportunity to acquire the foundation for the academic and problemsolving skills needed to succeed in the 21st century. University Studies offers students a programof connected educational opportunities.
The purpose of the University Studies programis to facilitate the acquisition of the knowledge, abilities, and attitudes that will form a foundation for lifelong learning among its students. This foundation is built on four learning goals which include building capacity and the propensity to engage in critical thinking, using various forms of communication for learning and expression, exploring and analyzing the broader human experience and its environment, and appreciating the responsibilities of persons to thems elves, each other, and their communities.
University Studies begins with Freshman Inquiry, a yearlong course introducing students to different modes of inquiry and providing them with the tools to succeed in advanced studies and their majors. At the sophomore level, students choose three different courses, each of which leads into a thematically linked, interdisciplinary cluster of courses at the upper-division level. Students are required to complete 12 credits fromone of these clusters. Finally, all students are required to complete a capstone course which consists of teams of students from different majors working together to complete a project addressing an is sue in the Portland metropolitan community.
University Studies courses transfer to other institutions. For more information or as sistance vis it the University Studies website www.pdx.edu/university-studies/transferring-credits or the Office in 117 Cramer Hall.

## Freshman Inquiry

See the University Studies Program website ( www.pdx.edu/unst) for course descriptions
Freshman Inquiry consists of a year-long course developed by a team of faculty from different disciplines. Freshman Inquiry has a maximum class size of 36 students. Each class is also divided into three small-group, peer mentor
ses sions led by specially selected upper-division students. Class material is introduced and explored during the full class sessions and then as signments are developed and discussed in the peer mentor sessions.
While the themes and content of the Freshman Inquiry courses differ, the overall objectives are the same. Each of these classes builds a foundation of communication skills for learning and expression. Writing is the core, but communication also includes emphasis on improving oral, quantitative reasoning, and graphic/visual modes of communication. Freshman Inquiry is also designed to help students learn and effectively use current information technologies. Students will also learn how disciplines from the sciences, social sciences, humanities, and professional schools approach problems in different ways and how they work together to improve understanding of complex is sues.
When students complete Freshman Inquiry they will be expected to be able to apply writing, quantitative reasoning, speech, and visual/graphic skills to problems requiring analysis and discovery. Freshman Inquiry will expand awareness of academic potential and prepare students to move on to increasingly rigorous and sophisticated levels of inquiry.

## Sophomore Inquiry

See the University Studies Program website (www.pdx.edu/university-studies/sinq-junior-clusters) or online schedule of courses for course descriptions.

At the sophomore level, students complete 8 credits of coursework in Sophomore Inquiry. Students select two Sophomore Inquiry classes. Sophomore Inquiry classes are structured similarly to those in Freshman Inquiry with a main class and smaller mentor inquiry works hops, except at this level the mentor classes are led by graduate students. Mentor inquiry works hops focus on weekly learning modules on study skills, writing, technology training, groupdynamics, speech and oral communication.

Sophomore Inquiry classes maintain an interdisciplinary approach to their individual topics, and continue to emphasize the four University Studies goals of Inquiry and Critical thinking, Communication, Diversity Equity, and Social Justice, and Ethics Agency and Community. Each Sophomore Inquiry class also provides an introduction to important concepts, questions, and concerns that will be explored in greater depth in the upper-division cluster courses to which it is linked.

Prior to Fall 2022, The Sophomore Inquiry requirement was 12 credits and was directly linked to the Upper-

Division Cluster Theme. The 8-credit requirementonly applies to students starting at PSU after Summer 2022.

## Upper-Division Cluster

See the University Studies Program website (www.pdx. edu/university-studies/sinq-junior-clusters) for descriptions of upper-division clusters andlists of approved cluster courses.

After their Sophomore Inquiry coursework, students select an Upper-Division Cluster. Beginning in Fall 2022, the Upper Division Cluster does not need tolink to any of the SINQ courses the student has taken, although it is recommended. Froma list of courses approved for the selected cluster, students pursue a programof 12 upperdivision credits offered by various departments across campus. These clas ses allow students to explore an aspect of the cluster's theme in greater depth, while continuing to investig ate the four University Studies goals in relation to the cluster topic.

Students might choose a cluster to broaden their perspective, allowing themthe opportunity to take classes of interest outside their major, or students can choose a cluster to complement their major area of study. In either event, Upper-Division Cluster courses may notbe used to fulfill a student's major requirement. In addition, students cannot take cluster courses in their major or courses cross listed with their majors. The Upper Div is ion Cluster theme completed is recognized as a note on the student transcript.

## Senior Capstone

## See the University Studies Program website ( www.capstone.unst.pdx.edu) for course descriptions.

The culmination of the University Studies programis the Caps tone course requirement. This 6-credit, communitybased learning course is designed to provide students with the opportunity to apply, in a team context, what they have learned in the major and in their other university studies courses to a real challenge emanating from the community. Interdisciplinary teams of students address these challenges and produce a summation product in a University Studies approved Capstone course under the instruction of a PSU faculty member.
The Capstone's purpose is to further enhance student learning while cultivating critical life abilities that are important both academically and professionally: establishing connections within the larger community, developing strategies for analyzing and addressing problems, and working with others trained in fields different from one's own.

Independent volunteering, work experience, by arrangement credits, internships and practica cannot fulfill the Capstone requirement. Students musthave completed 90 credit hours before registering for their Capstone course. Students should read and follow the Capstone attendance policy.

## COLLEGE OF THE ARTS

Leroy E. Bynum, Jr., Dean
Barbara Heilmair, Associate Dean
Lincoln Hall 349
503-725-3105
www.pdx.edu/arts

- B.A., B.S.-Architecture, Art History, Film, Music Performance, Music Theory, Musicology/Ethnomusicology, Sonic Arts and Music Production, Theater Arts
- B.F.A.-Art Practice, Graphic Design
- B.M.-Composition, Jazz Studies, Music Education, Performance, Performance with an Emphas is in Voice
- Certificate in Art History
- Certificate in Dance
- Minor in Architecture; Art History; Art Practice; Dance; DesignManagement (non-art majors only); Film Studies; Graphic Design; Music; Music History; Theater Arts
- Graduate Certificate in Music Performance
- Graduate Certificate in Public InterestDesign
- Graduate Certificate in Urban Design
- M.A.,M.S.-Music, Theater Arts (suspended)
- M.M.-Conducting, Jazz Studies, Performance
- M.Arch.—Architecture (2-year and 3-year tracks)
- M.F.A.-Contemporary Art Practice

The College of the Arts prepares talented students for creative careers and lifelong enrichment through intellectual discovery and myriad cultural experiences. Students are challenged to see their work within the artistic and critical traditions that provoke their own creative thinking and to seek interdis ciplinary approaches and collaboration in both local and global contexts. Located on the Park Blocks in downtown Portland, the College joins the Portland Art Museumand Portland Center for the Performing Arts in the heart of the city's cultural district. Within blocks of the College, theaters, galleries, professional studios, and design and architectural firms provide a stimulating environment in which our students develop through interactions and internships. The combination of a celebrated faculty and a professional arts community creates exciting undergraduate and graduate programs with rigorous standards in all four Schools within the College-Architecture, Art + Design, Film, and Music \& Theater.

## DEGREE MAPS AND LEARNING OUTCOMES

To view the degree maps and expected learning outcomes for the College of the Arts' undergraduate degrees, go to https://www.pdx.edu/academic-programs/a-z.

## ADMISSION REQUIREMENTS

## Policy on admission to undergraduate programs

Students may declare the major at any time after enrolling at Portland State University, with the exception of Music, which requires admis sion immediately. Specific application deadlines, criteria for admission and applications are available on respective School websites.
Students transferring fromother institutions who want to be admitted formally to a specific degree programmust:

- Meet all eligibility requirements.
- Apply for admis sion to PSU.
- Have one copy of their transcripts sent to the Office of Admissions.
- Apply for programadmission to the School of choice (including, if requested, one copy of their transcripts sent to the School of their choice).

Please see individual School websites for more specific admis sions information.

## DIFFERENTIAL TUITION

Graduate students and upper-division majors in the College of the Arts pay differential tuition - that is, slightly higher rates for more expensive programs - as also shown in the tuition charts online andelsewhere in this Bulletin:

Undergraduateresidents $\$ 11.40$ per credit hour
Undergraduate non-residents $\$ 46.00$ per credit hour
Graduate residents $\$ 47.00$ per credit hour
Graduate non-residents $\$ 51.00$ per credit hour
Graduate students will be charged differential rates upon matriculation.
Lower-division undergraduates (freshmen and sophomores) will not be charged differential rates until they have completed 90 credit hours or passed review to upper-division status. Undergraduate transfer students with 90 or more credit hours will be charged differential rates immediately upon matriculation.

Double majors will be chargedCOTA differential tuition unless the second major is in another College or program also charging differentialtuition (Business, Engineering), in which case students will be charged one or the other of their programs' differential rates.

Honors students will be charged both COTA differential tuition and Honors differential tuition.

Upper-division undergraduates changing majors to a COTA programfrom another School or College will be charged differential tuition.

## Upper-division undergraduates changing majors from a COTA program to another College or School must ask their COTA School administrative staff to remove College Code 26 from their records o that COTA's differential tuition will no longer be charged.

For those who fail to alert their COTA School immediately that they are leaving their major, refunds of differential tuition will only be issued for one term prior to the termin which students do notify the COTA School.
Students changing majors froma COTA School will no longer have access to certain restricted courses.

## School of Architecture

235 Shattuck Hall
503-725-8405
www.pdx.edu/architecture/

- B.A., B.S.-Architecture
- Minor-Architecture
- M. Arch: 2-year track and 3-year track
- Graduate Certificate in Public InterestDesign
- Graduate Certificate in Urban Design

The architecture programengages students in the fascinating creative questions that pertain to the making of architecture. The program develops thecreative identity of each student while nurturing civic responsibility, critical judgment and the representational and technical ability to translate ideas into plausible architectural works. This lies at the core of an educational experience that provides a rich initiation into the world of architectural practice and preparation for a career as a licensed professional. The heart of the programresides in the architecture design studio and is nouris hed by the accompany ing lecture and seminar courses that bring focused study in the humanities, technology, and the profession. Alongside a progressive attitude to design process and theoretical speculation, the programparticipates in the advancement of knowledge in contemporary is sues and technologies of sustainable urban living and environmental stewardship.
In giving place to human situations architecture bears the responsibility of being the most public of the arts and it
cannot be practiced meaningfully without a conversation with the community at large. Our design studio classes, in particular, are sustained by an engagement beyond the university to the life-world we share with our urban cohabitants, including direct interaction with the architectural practice community through our adjunct professors, critics, guest speakers and advisers. This fosters the generation of imaginative res ponses to the challenge of 'what ought to be' in the context of 'what is'.
The educationalemphasis of the programencourages students to recognize the value of creativeengagement with the prevailing realities of the city as a primary means of cultural transformation, and to perceive Portland as an 'urban laboratory' for experimental investigations of contemporary human is sues. This takes place through interaction and dialogue with the communities at large and by continual acts of interpretive making with diverse media at multiple scales, including full-size fabrication.

## Undergraduate programs

Portland State University encourages the study of architecture at the undergraduate level in the context of a broad and enriching liberal arts education. It is important to understand the place of a specialist or professional knowledge of architecture in relation to its wider cultural setting. Students studying for the undergraduate degree would include those seeking a professional education leading to graduate study and eventually licens ure, those seeking careers in design and related fields, and those interested in a liberal arts education focused on architecture.

## DEGREE MAPS AND LEARNING OUTCOMES

To view the degree maps and expected learning outcomes for the College of the Arts' undergraduate degrees, go to https://www.pdx.edu/academic-programs/a-z.

## ADMISSION REQUIREMENTS

Admission as an undergraduate is based on general University admis sion requirements.

## ARCHITECTURE B.A./B.S.

Portland State University encourages the study of architecture at the undergraduate level in the context of a broad and enriching liberal arts education. It is important to understand the place of a specialist or professional knowledge of architecture in relation to its wider cultural setting. Students studying for the undergraduate degree would include those seeking a professional education leading to graduate study and eventually licensure, those seeking careers in design and related fields, and those interested in a liberal arts education focused on architecture.

## DEGREE REQUIREMENTS

The B.A./B.S. major in Architecture requires the completion of a minimum of 100 credits in addition to the general University requirements for a degree. The required courses are as follows:

## Courses

Arch 100 Introduction to Architecture 4
Arch 101 Introductionto Environmental 4
Arch $120 \quad$ Visual Communication 1
Arch $121 \quad$ Visual Communication $2 \quad 4$
Arch $230 \quad$ Architecture and Cultural 4 History I
Arch 231 Architecture and Cultural 4
Arch 232 Architecture and Cultural 4
History III
Arch $280 \quad$ Design Fundamentals Studio $1 \quad 6$
Arch 281 Design Fundamentals Studio $2 \quad 6$
Arch 360 Building Tectonics $1 \quad 4$
Arch $361 \quad$ Building Tectonics 24
Arch 362 Building Tectonics 3
Arch 380 Architectural Design Studio $1 \quad 6$
Arch 381 and/or 382 Arch
Design Studio 2 and/or 3 and/or
Arch 384,385 and/or Arch
Design Focus Studio 1 and 2
Arch 46x Building Tectonics Elective
Arch $480 \quad$ Architectural Design Studio $4 \quad 6$
Arch $481 \quad$ Architectural Design Studio $5 \quad 6$
Arch 482 Architectural Design Studio $6 \quad 6$
Arch
3xy/4xx
Architectural Upper-Division Elective

Admis sionto the professional track and junior level Architecture DesignStudios ( 380 sequence) is based on a competitive review of a student's academic record, a statement of intent, and a portfolio of creative work. All students must obtain an adviser for academic planning of their programof study. At least one of the Architectural upper-division electives mustbe taken in the 'Humanities' subject area ( 43 x numbered classes). Architecture courses taken under the undifferentiated grading option (pass/no pass) will not be accepted toward fulfilling major requirements.

Students must obtain at leasta B- grade in all 100- and 200-level required architecture classes for themto count towards the major. All other clas ses used to satisfy the major must be graded C - or higher. Students receiving a grade below these minimums in any architectural studio class, or having an outstanding Incomplete (I) in any sequential class, will not be permitted to progress to the next class in the sequence until the minimum grade or higher has been earned in that class, or the Incomplete has been replaced by the minimum allowable grade.

The School of A rchitecture reserves the right to retain permanently for archival or exhibition purposes any student work executed as part of a School of Architecture instructional program. In addition, the School reserves the right to document, reproduce, and publishimages of any such student work in PSU publications, printed or electronic, for the purposes of research, publicity, and outreach, giving publication credit to the student.
Owning a laptop computer system will provide critical advantages in your progress through the Architecture program, especially the ability to work in any of our classrooms or studios. Therefore, all students studying Architecture are required to own a laptop computer that meets minimum systemspecifications publis hed by the School, including software required for courses in our program. Contact the School office for complete information on our Student Laptop Program, or consult the school website.
Subtotal: 100

## REQUIREMENTS FOR THE MAJOR IN ARCHITECTURE WITH A CONCENTRATION IN ARCHITECTURAL PROJECT M ANAGEMENT

This program is currently suspended and not accepting applications.

In addition to the general University requirements for a degree (p.31), the student who specializes in architectural project management is expected to meet the following requirements:

## Courses

BA 101 Introductionto Business and 4
World Affairs
BA 205 Business Communications Using 4
Technology
BA 211 Fundamentals of Financial 4
Stat 243 Introduction to Probability and 4
Arch 100 Introductionto Architecture 4
Arch $280 \quad$ Design Fundamentals Studio $1 \quad 6$
Arch 281 Design Fundamentals Studio $2 \quad 6$
Arch 360 Building Tectonics $1 \quad 4$
Arch 361 Building Tectonics $2 \quad 4$
Arch 425 Computational Design \& Digital 4 Making I
Arch 426 Computational Design \& Digital 4 Making II
Subtotal: 88
ARCHITECTURE MINOR

## REQUIREMENTS

To earn a minor in architecture a student must complete the following 40 credits:

| Courses |  |  |
| :--- | :--- | :--- |
| Arch 100 | Introductionto Architecture | 4 |
| Arch 101 | Introductionto Environmental | 4 |
|  | Design | 4 |
| Arch 120 | Visual Communication 1 | 4 |
| Arch 121 | Visual Communication 2 | 4 |
| Arch 230 | Architecture and Cultural History | 4 |
|  | I | 4 |
| Arch 231 | Architecture and Cultural History | 4 |
|  | II | 4 |
| Arch 232 | Architecture and Cultural History | 4 |
| Arch 280 | III |  |
| Arch 281 | Design Fundamentals Studio 1 | 6 |
| Subtotal: 40 |  | 6 |
| Architecture courses taken under the undifferentiated |  |  |
| grading option (pass/nopass) will not be accepted toward |  |  |
| fulfilling minor requirements. |  |  |

Eighteen of the final 24 credits must be taken in residence at PSU.

## Graduate programs

The NAAB accredited professional Master of Architecture at Portland State University encourages substantive investigation of significant urban situations and prevailing architectural is sues pertinent to contemporary human experience. It meets the demands of an accredited first profes sional degree in architecture as determined by the National Architectural Accrediting Board.

Through a series of focused design studios, and courses in humanities, technology and the profession, the program encourages depth in questioning, aptitude in discursive thinking, and versatility in means of representation as each student as similates the skills, knowledge and dexterity to negotiate the professional demands of comprehensive design while developing a mode of creative inquiry that extends beyond established conventions to possibilities yet to be tested in a critical arena. Student generated questions and polemics will form the inspiration for the final year Design Thesis exploration culminating in a unique thesis proposal fully articulated in drawings, models and text.
We offer two tracks towards the Master of Architecture: the 2-year track for candidates with a pre-professional undergraduate degree in Architecture ( 74 credits); and the 3-year track for candidates with a Bachelor's degree in any discipline ( 134 credits).

We also offer two graduate certificates: a Graduate Certificate in Public Interest Design consisting of coursework and fieldwork that will prepare future leaders
in architecture and related fields to aid currently underserved populations throughout the world through sustainable design methods, with an emphasis on addressing social, economic and environmental is sues; and a Graduate Certificate in Urban Design, focusing on the design of urban public space, offered in partnership with the Toulan School of Urban Studies and Planning.

## ADMISSION REQUIREMENTS

To be eligible to enter the 2-y ear Master of Architecture programa candidate must have completed a 4-year undergraduate pre-professional degree majoring in architecture (BA, BS or BFA), including at least 67.5 quarter credits ( 45 semes ter credits) of generaleducation classes. To be eligible to enter the 3-year track a candidate must have completed a Bachelor's degree in any discipline. Admission to the graduate programis based upon satisfaction of the ins titutional requirements together with competitive application. Submis sion materials include a portfolio of architectural design and other creative work, a statement of intent, undergraduate GPA, a GRE score, curriculumvitae, and at least 3 letters of recommendation. Please contact the School for detailed application information and deadlines.

Submission materials for the Certificate in Public Interest Design include the above with the statement addressing interest in public interest design and a proposed timeline for completing the Certificate. (A GRE score is not required for the Certificate.) Admission to the Certificate in Urban Design is based onevidence of suitable preparation and the probability of success. See school websites for application criteria and processes. All students wishing to earn the certificates must be formally admitted to the programs via the respective admis sions processes.

## ARCHITECTURE M.ARCH: 2-YEAR TRACK

## DEGREE REQUIREMENTS

Students must complete a minimum of 74 graduate level credits including the following:

## Courses

Arch 530

Arch 53x
Arch 540
Arch 54x
Arch 560
Arch 580
Arch 581
Arch 582
Arch 511
Arch 584
Arch 585

Contemporary Architectural Theory
Architectural Theory Elective
Professional Practice
Professional Practice Elective
Advanced Architectural Technology
Architectural Design Studio 7
Architectural Design Studio 8
Architectural Design Studio 9
Pro-Thesis Seminar
Design Development Studio
Design Thesis

Arch 586 Integrated Systems 6
5xx Special InterestElectives
Subtotal: 74
The Master of Architecture programis designed for students intending to become licensed architects and has full professional accreditation with the National Architectural Accrediting Board.

In the United States, most state registration boards require a degree froman accredited professional degree program as a prerequisite for licens ure. The National Architectural Accrediting Board (NAAB), which is the sole agency authorized to accredit U.S. professional degree programs in architecture, recognizes three types of degrees: the Bachelor of Architecture, the Master of Architecture, and the Doctor of Architecture. A programmay be granted a 6year, 3-year, or 2-year term of accreditation, depending on the extent of its conformance with established educational standards.
Doctor of Architecture and Master of Architecture degree programs may consist of a pre-professional undergraduate degree and a professional graduate degree that, when earned sequentially, constitute an accredited professional education. However, the pre-professional degree is not, by itself, recognized as an accredited degree.

Portland State University, School of Architecture offers the following NAAB accredited degree programin architecture: M.Arch (pre-professional degree +74 graduate credits). Next accreditation visit for all programs: 2023.

The School of Architecture reserves the right to retain permanently for archival or exhibition purposes any student work executed as part of a School of Architecture instructional program. In addition, the School reserves the right to document, reproduce, and publish images of any such student work in PSU publications, printed or electronic, for the purposes of research, publicity, and outreach, giving publication credit to the student.
Owning a laptop computer system will provide critical advantages in your progress through the Architecture program, es pecially the ability to work in any of our clas srooms and studios. Therefore, all students studying Architecture are required to own a laptop computer that meets minimum system specifications published by the School, including software required for courses in our program. Contact the School office for complete information on ourStudent Laptop Program, or consult the school website.
Grades of $\mathrm{C}+$ or lower will not count towards meeting Master of Architecture degree requirements. Students are strongly advised to become familiar with the standards for academic accomplishment described in detail in the Graduate Studies section of this bulletin.

ARCHITECTURE M.ARCH: 3-YEAR TRACK

## DEGREE REQUIREMENTS

Students will enter the programin the Summer term and must complete 4-quarters of graduate transition courses with a minimum of 60 credits followed by the requirements for the 2-year track, for a total of 134 credits to graduate. The transition programincludes the following:

| Courses |  |  |
| :--- | :--- | :--- |
| Arch 522 | Architectural Graphics and <br> Media | 4 |
| Arch 536 | Architectural History and Theory | 4 |
|  | I |  |
| Arch 537 | Architectural History and Theory | 4 |
|  | II |  |
| Arch 538 | Architectural History and Theory | 4 |
|  | III | 4 |
| Arch 539 | Architectural History and Theory | 4 |
|  | IV | 4 |
| Arch 567 | Architectural Structures | 4 |
| Arch 568 | Architectural Technology I <br> Arch 569 | Architectural Technology II <br> Arch 564 |
| Architectural Technology III | 4 |  |
| Arch 570 | Architectural Design Transition | 4 |
| Arch 571 | Studio I <br> Architectural Design Transition | 6 |
| Arch 572 | Studio II <br>  <br> Arch 573 | Architectural Design Transition <br> Studio III <br> Architectural Design Transition |
|  | Studio IV | 6 |
|  | 6 |  |

Subtotal: 60

## PUBLIC INTEREST DESIGN GRADUATE CERTIFICATE

## DEGREE REQUIREMENTS

The course of study for the Certificate in Public Interest Design is divided into credits for coursework and fieldwork, with a minimum of 18 credit hours. Fieldwork will provide students with real world experience in the practice of public interest design through immersed applied-learning opportunities. Field work may be achieved through participation in rotating programs through the Center for Public Interest Design that offer opportunities for engagement and action within a community, or through an approved practicumworking with a firm or organization engaged in public interest design work. As the culmination of their certificate, students will submit a thorough portfolio of the work they participated in to complete their fieldwork, containing a thoughtful reflection of their
experience within the realmof public interest design and how it can inform their careers going forward.

## COURSEWORK

## Core Requirements

| Arch 533 | Contemporary Is sues Seminar- <br> Public Interest Design in Practice | 4 |
| :--- | :--- | :--- |
| Arch 541 | Practicum- Public Interest <br> Design Fieldwork | 4 |

## Subtotal: 8

Choose at least ONE course fromEACH of the three focus areas below, for a combined total of 10 credit hours:

## Social

| Arch 585 | Design Thesis (PID Focus, Architecture students only) | 6 |
| :---: | :---: | :---: |
| $\begin{aligned} & \text { Mgmt } \\ & 521 \mathrm{~S} / \mathrm{Mgmt} \\ & 521 \end{aligned}$ | Design Thinking for Social | 4 |
|  | Innovation |  |
|  | (offered online) |  |
| PA 543 | Creating Collaborative | 3 |
|  | Communities |  |
| USP 550 | Participatory Planning | 3 |
| USP 552 | Urban Poverty in Critical | 3 |
|  | Perspective |  |
| Environmental |  |  |
| Arch 563 | Building Science Research | 4 |
|  | Topics |  |
|  | (PID focus) |  |
| ESM 588 | Environmental Sustainability | 4 |
| ESM 528 | Urban Ecology | 4 |
| Geog 532 | Urban Landscapes | 4 |
| USP 588 | Sustainable Development | 3 |
|  | Practices |  |
| Economic |  |  |
| Arch 543 | Topics in Professional Practice | 4 |
|  | (PID focus) |  |
| PA 525 | Grantwriting for Nonprofit | 3 |
|  | Organizations |  |
| PA 541 | Social Entrepreneurship | 3 |
| Mgmt 522S | Money Matters forSocial | 4 |
|  | Innovation (offered online) |  |
| USP 580 | Political Economy of Nonprofit | 3 |
|  | Organizations |  |
| USP 590 | Green Economics and | 3 |
|  | Sustainable Development |  |

Subtotal: 10

Total Credit Hours: 18

## URBAN DESIGN GRADUATE CERTIFICATE

Two things about cities, their design and planning, have become abundantly clear in the early 21 st century: first, even at the largest scales, the details matter, and second, good policy is important, but it's notenough to create a great place. Together, these two lessons of the last 100 years of urban placemaking in America havebroughtnew interest and attention to urban design.
What is Urban Design? The term generally means the process for shaping urban growth, conservation and change - making design decisions about individual buildings as well as big plans about the design of streets, public spaces, and collections of buildings. Urban design combines the aes thetic and three-dimensional design skills of the architect with the decision-making, eng agement, and management methodologies of the urban planner. What excites the urban designer is the making of memorable and artful places - places that are pleasant to be in as well as go through, places that reflect the uniqueness of different communities.

The Graduate Certificate in Urban Design at Portland State University, a joint effort of the Toulan School of Urban Studies and Planning and the School of Architecture, has been created to offer planners, designers, and architects the opportunity to engage and incorporate in theirown work the principles and methods of urban design. It utilizes the Portland-Vancouver metropolitan region as a laboratory, an urban place renowned for its use of urban design and attention to urbandesign concerns. This certificate is intended for those who are currently seeking an advanced planning or architecture degree, or who are currently employed as a professional planner, architect, or designer.

## COURSEWORK

The Graduate Certificate in Urban Design consists of five required core courses, for a total of 20 credit hours.

## Core Requirements

Theory

| Arch 532 | History and Theory of Urban <br> Design | 4 |
| :---: | :--- | :---: |
| USP 513 | Public Space | 4 |
| Methods |  | 4 |
| Arch 521 | Urban Design Methods |  |
| Practice |  | 4 |
| USP 575 | Urban Design Workshop | 4 |
| Arch 531 | Studies in Contemporary Urban | 4 |

If a student cannot fulfill one of the classes in the certificate, the student can take an equivalent class to the one missed, to be approved by the committee on a case-by case basis.
Subtotal: 20

## Application and Admission Requirements

Admis sion to the GraduateCertificate in Urban Design programis limited to graduate students currently enrolled in either the MURP or M.ARCH programs; graduate students in other programs who have an undergraduate or graduate design degree, those who have completed an undergraduate or graduate design degree, or those who have completed a graduate planning degree froman accredited planning degree program.
In addition, admission to graduate study at Portland State University is granted on the basis of evidence of suitable preparation and the probability of success in the intended field of study. Admission generally requires a minimum of an accredited baccalaureate degree and a GPA which meets univers ity graduate admis sion standards. Typically, students admitted to graduate study at Portland State have an underg raduate or graduate (minimum of 12 credit hours ) GPA of at least 3.0.

If you meet all of these requirements, please visit the websites of either the Toulan School of Urban Studies and Planning (www.pdx.edu/usp) or the School of Architecture (www.pdx.edu/architecture) for more information.

If you are currently admitted to a masters or doctoral programat PSU, in good academic standing, and currently reg istered for clas ses, please contact the representatives named below.

For more information, please contact the GCUD coordinators: A aron Golub, Toulan School of Urban Studies and Planning, agolub@pdx.edu, 503-725-4069; Anna Goodman, School of Architecture, good7@ pdx.edu, 503-725-8405.

## School of Art+Design

## 110 Art Building

503-725-3515
http://www.pdx.edu/art-design

- B.A., B.S.—Art History
- B.F.A.-Art Practice, Graphic Design
- Minors in Art History, Art Practice, Design Management, and Graphic Design
- Secondary Education Program
- Certificate in Art History
- M.F.A. in Contemporary Art Practice (Studio and Social Practice tracks)

Driven by a belief in the power of art to shape society, the School of Art+Design and its dynamic faculty provide a place where emerging artists, designers and art his torians can question, create, reflect and learn. The School of Art+Design offers an interdisciplinary course of study for students interested in the ways that art, art history and design serve the expressive aspirations of individuals and communities. Students work directly with faculty to plan and carry out a programof study that connects the his tory, theory and practices of art and design. Studio-based instruction is joined with lectures, seminars and workshop classes. The culture of the School is one of research, writing, art making, critique and reflection.

## SCHOOL ARCHIVAL POLICY

The School of Art+Design reserves the right to retain for archival or exhibition purposes any student work executed as part of a School of Art+Design ins tructional program. In addition, the school reserves the right to document, reproduce, and publish images and any other media containing such student work in PSU publications, printed or electronic, for the purposes of research, publicity, and outreach, giving publication credit to the student.

## Undergraduate programs

The school offers the following undergraduate degree options: B.A., B.S. and Certificate in Art History, B.F.A. in Art Practice, and B.F.A. in Graphic Design.

## DEGREE MAPS AND LEARNING OUTCOMES

Degree maps display the sequence of courses leading to completion of the major or minor. To view the degree maps and expected learning outcomes for Art+Design's undergraduate degrees, go to
https://www.pdx.edu/academic-programs/a-z. for Art History, Art: Graphic Design, and Art: Practices.

## UNDERGRADUATE ADMISSION REQUIREMENTS

Admission to the school is based on general admission to the University. Upper-division coursework is restricted to students who meet requirements establis hed by their major. Review the Graduation Planner and the Art+Design website for further information.

## ART MAJOR AND MINOR DEGREE REQUIREMENTS

All students entering the COREProgramare required to own a laptop computer that meets minimum system specifications as well as software required for courses.

Those interested in studying graphic design, please review the laptop policy.

## ART HISTORY—B.A./B.S.

The study of the history of art enables the student to analyze diverse works of art and to relate artistic production to his torical, cultural, and philosophical factors.

Art his tory is a flexible degree that prepares students for a range of jobs that require strong communication, research, and critical thinking skills.

## REQUIREMENTS FOR THE B.A./B.S. IN ART HISTORY

| Two of the following three core courses: |  |  |
| :---: | :---: | :---: |
| ArH 106 | Introduction to Visual Literacy | 2 |
|  | or |  |
| ArH 110 | Visual Literacy | 4 |
|  | And |  |
| Art 104 | CORE: Digital Tools | 2 |
| Art 105 | CORE: Ideation | 2 |
| Additional Requirements |  |  |
| ArH 204 | Art History: The Ancient World | 4 |
| ArH 205 | Art History: The Medieval World | 4 |
| ArH 206 | Art History: The Modern World | 4 |
|  | Eight 4-credit upper-division art history courses, at least two of which must be seminars: ArH 407, ArH410, and/or ArH 449. | 32 |
|  | An additional 16 credits of advis or-approved lower- and/or upper-division courses in art history, art practices, graphic design; courses offered in Architecture, Film, Music \& Theater; and/or other select liberal arts courses. | 16 |

Total CreditHours: 66

ART PRACTICE—B.F.A.
The BFA in Art Practice is a profes sional degree that provides students with knowledge and skills that will prepare themfor careers as practicing artists and/or further pursuit of the Master of Fine Art degree. The program offers a comprehensive education in visual art practices, applications, theories, and history, with an emphasis on trends in contemporary art. BFA students are required to
research, develop, as semble, present, and defend a body of well conceived and executed work.

## DEGREE REQUIREMENTS

| Required Courses |  |  |
| :--- | :--- | :--- |
| ArH 106 | Introduction to VisualLiteracy | 2 |
| ArH 398 | Contemporary Art | 4 |
| Art 101 | CORE: Surface | 5 |
| Art 102 | CORE: Space | 5 |
| Art 103 | CORE: Time | 5 |
| Art 104 | CORE: Digital Tools | 2 |
| Art 105 | CORE: Ideation | 2 |
| Art 131 | Introductionto Drawing I | 4 |
| Art 303 | Making and Meaning | 4 |
| Art 336 | BFA: Research andProposal | 4 |
| Art 339 | BFA Vertical Lab I: | 4 |
|  | Collaboration andPresentation |  |
|  | Strategies |  |
| Art 439 | BFA Vertical Lab II: | 4 |
|  | Collaboration andPresentation |  |
|  | Strategies |  |
| Art 485 | Professional Practices for Artists | 2 |
| Art 496 | BFA Project I | 4 |
| Art 498 | BFA Project II | 4 |
| Art 499 | BFA Oral Review | 2 |

Subtotal: 57
Choose 8 credits from the following course options
Des $290 \quad 4$
Any 200-level ArH course
Subtotal: 8
Choose 4 of the following 200-level Art Studio courses
Art 216 Sewn Construction 4

Art 227 Introduction to Art and Social 4
Practices
Art 230 Drawing II 4
Art 250 Life Drawing I 4
Art 255 Two-dimensional Animation I 4
Art 257 Introductionto Video Art 4
Art 260 Black and White Photography 4
Art 261 Digital Photography 4
Art 270 Introductionto Printmaking: 4
Relief
Art 271 Introductionto Printmaking: 4
Etching
Art 281 Intro to Painting 4
Art $282 \quad$ Painting Topics 4
Art 291 Introduction to Sculpture 4
Art 292 Introductory Sculpture Topics 4
Art 296 Digital Drawing, Painting and 4
Printmaking

| Choose 8 credits from the following options |  |  |
| :---: | :---: | :---: |
| Art | History of Dress I | 4 |
| 322U/TA |  |  |
| 322 U |  |  |
| Art | History of Dress II | 4 |
| 323U/TA |  |  |
| 323 U |  |  |
| Art 330 | Critical Theories in Art I | 4 |
| Art 497 | A History of Art and Social | 4 |
|  | Practice |  |
|  | Any 300- or 400-level ArH course |  |
|  |  | Subtotal: 8 |
| Choose 28 credits from the following options |  |  |
| Art 312 | Art in the Elementary School | 4 |
| Art 313 | Textile Design | 4 |
| Art 316 | Fabric \& Form | 4 |
| Art 318 | Weaving:Pattern \& Structure | 4 |
| Art | History of Dress I | 4 |
| 322U/TA |  |  |
| 322 U |  |  |
| Art | History of Dress II | 4 |
| 323U/TA |  |  |
| 323 U |  |  |
| Art 327 | Intermediate Art and Social | 4 |
|  | Practices |  |
| Art 328 | KSMoCA:Museumin a Public | 4 |
|  | School |  |
| Art 331 | Art and Privilege | 4 |
| Art 350 | Life Drawing II | 4 |
| Art 355 | Video Installation | 4 |
| Art 356 | Visual Storytelling | 4 |
| Art 357 | Intermediate Video | 4 |
| Art 358/Des | Video, Design \& Community | 4 |
| 358 ( |  |  |
| Art 360 | Special Topics in Photography | 4 |
| Art 362 | Intermediate Photography | 4 |
| Art 370 | Topics in Printmaking | 4 |
|  | Techniques |  |
| Art 371 | Intermediate Printmaking | 4 |
| Art 373 | Intermediate Sculpture | 4 |
| Art 374 | Intermediate Sculpture Topics | 4 |
| Art 391 | Intermediate Drawing andMixed Media | 4 |
| Art 392 | Painting | 4 |
| Art 393 | Painting Topics | 4 |
| Art 401 | Research | 1-8 |
| Art 402 | Independent Study | 1-6 |
| Art 404 | Cooperative | 1-12 |
|  | Education/Internship |  |
| Art 406 | Projects | 1-8 |
| Art 408 | Workshop | 1-6 |
| Art 410 | Selected Topics | 1-12 |
| Art 416 | Textile Arts Studio | 4 |

minimum 20 credit hours in Music
minimum 20 credit hours in Art History
minimum 52 credit hours need to be upper level courses (300-level or higher)
ArH401 Advanced Research W orkshop and additional research-intensive courses such as a seminar are strongly recommended for all students in this program, and would be taken as part of your upper level course requirement.
Students should note when planning their coursework both that some of the upper level courses they are considering have prerequisites. Additionally, you will not be able to use any of the cluster courses that could be applied towards this major to satisfy the the University Studies cluster requirement.

## COURSE OFFERINGS:

| ArH 106 | Introductionto VisualLiteracy | 2 |
| :---: | :---: | :---: |
| ArH 204 | Art History: The Ancient World | 4 |
| ArH 205 | Art History: The Medieval World | 4 |
| ArH 206 | Art History: The Modern W orld | 4 |
| ArH 329 | Islamic Art: Major Themes and Periods: | 4 |
| ArH337U | Nature into Art | 4 |
| ArH355U | MedievalMonsters | 4 |
| ArH356U | Early Medieval Art and Architecture | 4 |
| ArH357U | Byzantine Art and Architecture | 4 |
| ArH358U | Medicine and Magic in Romanesque Art | 4 |
| ArH359U | Gothic Art and Architecture | 4 |
| ArH 360U | The Art of W ar: Representing the Crusades | 4 |
| ArH381U | 19th Century Art | 4 |
| ArH382U | 19th Century Art | 4 |
| ArH383 | Western Art in the 20th Century | 4 |
| ArH384 | Western Art in the 20th Century | 4 |
| ArH385 | Western Art in the 20th Century | 4 |
| ArH392 | History and Contemporary Issues in Photography | 4 |
| ArH398 | Contemporary Art | 4 |
| ArH 401 | Research | 0-12 |
| ArH415U | Is sues in Asian Art | 4 |
| ArH 426U | African Art | 4 |
| ArH | Women in the Visual Arts | 4 |
| 431U/WS |  |  |
| 431 U |  |  |
| ArH 432U | Issues in Gender and Art | 4 |
| Des 290 | Histories of Graphic Design | 4 |
| Mus 105 | Introductionto Music Theory | 3 |
| Mus 203 | Music in the Western World | 4 |
| Mus 205 | Listening I | 1 |
| Mus 206 | Listening II | 1 |


| Mus 231 | Survey of PopularMusic Since $1950$ | 4 |
| :---: | :---: | :---: |
| Mus 274 | Introduction to World Music | 4 |
| Mus 355U | Jazz History | 4 |
| Mus 356U | Jazz And American Culture: How History Shaped OurMusic, Then and Now | 4 |
| Mus 360U | The Guitar: its History and Music | 4 |
| Mus 361U | History of Rock Music I (19501970) | 4 |
| Mus 362U | History of Rock Music II (1970Present) | 4 |
| Mus 363U | The Music of the Beatles | 4 |
| Mus 365U | Film Music | 4 |
| Mus 366U | New Orleans: Jazz and Culture in the Storyville Era | 4 |
| Mus 367U | The Music of Nashville: From Honky Tonk to Hip-Hop | 4 |
| Mus 368U | Motown: Detroit's His tory and Music | 4 |
| Mus 369U | Music and SocialChange | 4 |
| Mus 374U | World Music: Africa and the Middle East | 4 |
| Mus 376U | American Musical Traditions | 4 |
| Mus 377U | World Music: Latin America and the Caribbean | 4 |

Note that other upper level architectural, art, film and mus ic his tory classes offered at PSU might be applied to this degree, if you get prior approval fromthe Cultural His tory of the Arts programcoordinator.
Total Credit Hours: 60

## GRAPHIC DESIGN—B.F.A.

The graphic design programprovides a comprehensive education in design principles, applications, theories, history, and practice.
The first two years of study culminate with a required Sophomore Portfolio Review, occurring once each year at the end of the Spring term. All students majoring in graphic design (including students transferring in with lower- or upper-division credits) must pass this review to enroll in 300-level graphic design courses. Vis it the School of Art + Design website (http://www.pdx.edu/art-design/) or the graphic design programsite (http://psu.gd) for details. Only after successfully passing the review are graphic design majors allowed to continue through the program.

All students majoring in graphic design are required to own a laptop computer that meets minimum system specifications, including software required for courses in the program. The current laptop policy is available for
review at https ://www.pdx.edu/art-design/graphic-design-laptop-policy

## DEGREE REQUIREMENTS

| 100-Level Courses |  |  |
| :--- | :--- | :--- |
| Des 111 | Design Thinking | 4 |
| Des 120 | Digital Graphics | 4 |
| Des 121 | Introduction to Type and Design | 4 |
|  | Principles |  |
| Des 125 | Showand Tell | 1 |
| Des 140 | Foundations in Motion, UI, and | 4 |
|  | UX |  |

Subtotal: 17

| 200-Level Courses |  |  |
| :--- | :--- | :--- |
| Des 200 | Digital Page Design I | 4 |
| Des 210 | Digital Imaging and Illustration I | 4 |
| Des 224 | Storytelling and Narrative | 4 |
| Des 225 | Design Systems | 4 |
| Des 254 | Typography I | 4 |
| Des 290 | Histories of Graphic Design | 4 |
| ArH 2XX | Any 200-level Art History Class | 4 |

Subtotal: 28

| Sophomore Portfolio Review |  |  |
| :--- | :--- | :--- |
| 300 \& 400-Level Required Courses |  |  |
| Des 320 | Information Design |  |
| Des 321 | Brand Lab | 4 |
| Des 340 | Interaction Design Principles | 6 |
| Des 354 | Typography II | 4 |
| Des 408 | Workshop | 4 |
| Des 470 | Design Thesis I | 2 |
| Des 471 | Design Thesis II | 4 |
| Des 472 | Design Portfolio | 4 |

Subtotal: 34

| Upper Division Graphic Design Electives |
| :--- |
| Des |
| 3XX/Des |
| 4XX |

Subtotal: 28
Total CreditHours: 107

## ART HISTORY-CERTIFICATE

The Certificate in Art History offers the opportunity for students who have already completed a B.A. or B.S. to undertake an in-depth study in art his tory through a curriculumcentered in small discussion-based seminars and other upper-level coursework.

## DEGREE REQUIREMENTS

Students who have not already taken the 200-levelart history survey sequence or its equivalent elsewhere are encouraged to do so before undertaking the postbaccalaureate certificate upper-level coursework:

| ArH407 | Seminar | $0-12$ |
| :--- | :--- | ---: |
| ArH449 | Art History Methods | 4 |
|  | Four Additional Upper-Level | 16 |
|  | ARH courses |  |

Total Credit Hours: 24
ART HISTORY MINOR

| Two of the following: |  |  |
| :--- | :--- | :--- |
| ArH 204 | Art History: The Ancient World | 4 |
| ArH 205 | Art History:The Medieval | 4 |
|  | World |  |
| ArH 206 | Art History: The Modern World | 4 |
| Subtotal: 8 |  |  |
| One of the following: |  |  |
| ArH 106 | Introductionto VisualLiteracy | 2 |
| Art 104 | CORE: Digital Tools | 2 |

Subtotal: 2
Five Upper Division Art History Courses
Subtotal: 20
Total Credit Hours: 30

## MINOR IN ART PRACTICE

This minor is designed for non-art majors wanting to pursue a minor in the Art Practice program.

|  |  |  |
| :--- | :--- | ---: |
| Art 105 | CORE: Ideation | 2 |
| ArH 106 | Introductionto Visual Literacy | 2 |
|  | 3 Lower-division Art electives | 12 |
|  | 3 Upper-division Art electives | 12 |

Total Credit Hours: 28
DESIGN MANAGEMENT MINOR

| Des 290 | Histories of Graphic Design <br> or | 4 |
| :--- | :--- | :--- |
| Des 302U | Design is Everywhere | 4 |
| Des 100 | Introductionto Communication <br> Design for Non-Majors <br> or | 4 |
| Des 121 | Introductionto Type and Design <br> Principles | 4 |
| Des 120 | Digital Graphics | 4 |

Des $200 \quad$ Digital Page Design I ..... 4
Des 224 Storytelling and Narrative ..... 4
Des 367 Design Business Practices ..... 4
or
Des 340 Interaction Design Principles4
Total CreditHours: 24
MINOR IN GRAPHIC DESIGN
Des 290 Histories of Graphic Design ..... 4
Des 120 Digital Graphics ..... 4
Des 121 Introduction to Type and Design ..... 4
Des 200 Digital Page Design I ..... 4
Des 210 Digital Imaging and Illustration I ..... 4
Des 224 Storytelling and Narrative ..... 4
Des 225 Design Systems ..... 4
Des 254 Typography I ..... 4

Total Credit Hours: 32

## Graduate Programs

The School of Art+Design offers a two-year in-residency programin Studio Practice or a three-year flexibleresidency programin Social Practice leading to the Master of Fine Arts degree in Contemporary Art Practice. These 90 -credit programs prepare the student to be a practicing artist within a regional, national, and international arts community.

## GRADUATE ADMISSION REQUIREMENTS

Application for admission to the MFA programmust be made by January 8 prior to the fall term in which the student intends to begin work toward the degree.
Applicants must have a B.A., B.S., or B.F.A. degree in Art or a related field. Exceptions may be made for related experience and a solid art history background.
The school application is submitted online. For the most up to date information on the MFA programand its application process please visit our web site www.pdx.edu/art-design.

## CONTEMPORARY ART PRACTICES M.F.A.

## DEGREE REQUIREMENTS

Working with designated faculty during the first year, students are encouraged to explore new media, models and ideas as they develop a proposal for creative activity that
culminates with a graduate project in their final year of the program.

Students are admitted conditionally and must pass a midpoint candidacy review to gain regular admis sion to the univers ity and continue work to wards their degree. (Students in-residency receive a candidacy review at the end of their first year; flexible-residency students are reviewed at the end of their second year.)
Students complete 90 credits, dis tributed in the following way:

- 40 credits Contemporary Art Practice/Directed Studies
- 12 credits Visiting Artist Program/Group Critique
- 12 credits Contemporary Art History/Theory
- 8 credits Electives (outside School of Art+Design)
- 12 credits Graduate Seminars
- 6 credits Exhibition Project/Statement

Upon successfulcompletion of the candidacy review students work with a faculty adviser in their specified concentration to produce their graduate project. The project is presented in a public exhibition or other appropriate form in the spring quarter of the second or third year.

## ART EDUCATION: SECONDARY EDUCATION PROGRAM

## Grades $K$ through 12 in public schools

Students who plan to teach at the middle- or high-school level should complete a bachelor's degree in Art or prescribed art foundation/his tory courses before applying to the College of Education for teacher training in the graduate program.
Prospective teachers should contact an art adviser or the Art Practice Coordinator in the School of Art + Design to secure a departmental recommendation prior to applying to the COE.

Each student's programis tailored to meet the requirements of the continuing endorsement license. Although licens ure requirements are incorporated into degree programs, changes by the Oregon Teacher Standards and Practices Commis sion during the life of this catalog may alter the requirements. Applicants for licensure must meet the Commis sion's requirements in force at the time of the licensure application. Please refer to the College of Education requirements (p. 150).

## School of Film

127 Lincoln Hall
tel 503-725-4612
fax 503-725-4624
www.pdx.edu/film/

- B.A., B.S. in Film
- Minor in Film Studies


## Undergraduate Program

The Bachelor of Arts/Bachelor of Sciences in Film is designed to offer students the opportunity to major in a diverse film curriculumthat unites professional training in all aspects of film production with a deep understanding of film theory and scholarship. We ask students to engage with material that presents a wide range of academic and artistic challenges through critical thinking and hands-on practice. As such, the School of Film understands itself to work within the scholarly and pedagogical traditions of a liberal arts education, and faculty are committed to providing a strong emphasis on written, oral, and visual expression; criticalthinking; and diverse and international perspectives.

## DEGREE MAPS AND LEARNING OUTCOMES

To view the degree maps and expected learning outcomes for the College of the Arts' undergraduate degrees, go to https://www.pdx.edu/academic-programs/a-z.

## ADMISSIONS REQUIREMENT

See "Admission requirements (p. 8)" for information on general admission to the University.

FILM B.A./B.S.

## REQUIREMENTS

In addition to meeting the general University degree requirements, the major in film will plan a programwith a faculty adviser that meets the following minimum requirements:

| Core (32 credits) |  |  |
| :--- | :--- | :--- |
| FILM 131 | Film Analy sis | 4 |
| FILM 132 | Introduction to Digital | 4 |
|  | Filmmaking | 4 |
| FILM 231 | Film Analysis II | 4 |
| FILM 280 | Clas sical Film Theory | 4 |
| FILM 381 | Film History I | 4 |
| FILM 382 | Film History II | 4 |
| FILM 383 | Film History III | 4 |
| FILM 480 | Contemporary Film Theory |  |
| Critical and Theoretical Practices (16 credits) |  |  |
| Choice of 16 credits fromthe following: |  |  |
| FILM 257 | Narrative Film Production I | 4 |
| FILM 258 | Documentary FilmProductionI | 4 |
| FILM 358 | Narrative Film Production II | 4 |


| FILM 359 | Narrative Film Production III | 4 |
| :--- | :--- | :--- |
| FILM 360 | Topics in Film Production | 4 |
| FILM 361 | Documentary Film Production II | 4 |
| FILM 362 | Documentary Film Production III | 4 |
| FILM 363 | Topics in Experimental Film and | 4 |
|  | Media Production |  |
| FILM 364 | Sound:Production and Design | 4 |
| FILM 365 | Editing | 4 |
| FILM 366 | Digital Cinematography | 4 |
| FILM 374 | Topics in Screenwriting | 4 |
| TA 348 | Acting for the Camera | 4 |
| Art 255 | Two-dimensional Animation I | 4 |
| Art 257 | Introductionto Video Art | 4 |
| Art 296 | Digital Drawing, Painting and | 4 |
|  | Printmaking |  |
| Art 356 | Visual Storytelling | 4 |
| Art 357 | Intermediate Video | 4 |
| Art 455 | Time-Based Art Studio | 4 |
| Wr 416 | Screenwriting | 4 |

## Advanced Studies and Professional Development (12 credits)

| Choice of 12 credits fromthe following: |  |  |
| :---: | :---: | :---: |
| FILM 401 | Research | 1-6 |
| FILM 402 | Independent Study | 1-12 |
| FILM 404 | CooperativeEducation/Intemship | 1-12 |
| FILM 405 | Reading and Conference | 1-6 |
| FILM 406 | Project | 1-6 |
| FILM 407 | Seminar | 1-6 |
| FILM 408 | Workshop | 1-6 |
| FILM 409 | Practicum | 1-12 |
| FILM 410 | Selected Studies | 1-6 |
| FILM 450 | Portfolio and Profes sional Development | 4 |
| FILM 451 | Advanced Production Workshop |  |
| FILM 460 | Advanced Topics in Production |  |
| FILM 484 | Anatomy of a Movie |  |
| FILM 486 | Topics in Film and the Moving Image |  |
| FILM 487 | Topics in International Film and the Moving Image |  |
| International Cinemas (8 credits) |  |  |
| FILM 487 | Topics in International Film and the Moving Image |  |

Additional International Cinema electives that are offered within the university are listed on the program website and available from Pathway and School of Film advis ors.

## Film CurriculumElectives ( 12 credits)

Any FILM prefix courseexcept FILM 331U
Understanding Movies and FILM 130 Introduction to
Digital Filmmaking for Non-Film Majors

Additional electives that are offered within the university are listed on the programwebsite and available from Pathway and School of Film advisors.
Subtotal: 80
Courses taken under the differentiated grading option (pass/no pass) will not be accepted toward fulfilling major requirements. Except forFILM 131 and FILM 132, all courses used to satisfy the major requirements must be graded Cor above. Majors must be graded at a $\mathrm{C}+$ or above in bothFILM 131 and FILM 132. Majors may take FILM 131 and FILM 132 each twice to earn a minimum C+ grade in both to advance to 200-level and upperdivision courses.
At least 16 credits of upper-division major courses must be taken in residence at Portland State University.

## FILM STUDIES MINOR

## REQUIREMENTS

To earn the interdis ciplinary minor in film studies, a student must complete 28 adviser-approved film credits to include the following:

## Courses

FILM 131 Film Analysis 4
Eng 304 Critical Theory of Cinema 4
20 elective credits from the Film 20
curriculum with at least 12
carrying numbers 300 or above
Courses taken under the undifferentiated grading option (pass/no pass) will not be accepted toward fulfilling department minor requirements. All courses for the minor must receive a grade of Cor above.
At least 16 credits of film studies courses must be taken in residence at Portland State University. Credits will be applicable to the student's major when appropriate.
*Students may elect to pursue the film studies minor in the School of Film, English Department or Communications Department, and should consult the School/Department's film adv is or for a complete list of courses that would apply to the minor from offerings in each School/Department. Subtotal: 28

## School of Music \& Theater

## 231 Lincoln Hall

503-725-3011
www.pdx.edu/music-theater/

- B.A., B.S. in Music: Musicology/Ethnomusicology, Music Theory, Performance, Sonic Arts \& Music Production(SAMP)
- B.A., B.S. in Theater Arts
- B.M.-Composition, JazzStudies, Music Education, and Performance
- Minor in Dance, Minor in Music, Minor in Music History, and Minor in Theater Arts
- Certificate in Dance
- M.A., M.S. in Music and Theater Arts (suspended)
- M.M.-Conducting, JazzStudies, and Performance
- Graduate Certificate in Music Performance


## Mission statement

The School of Music \& Theater provides professional training and liberal arts-based education to a highly diverse student body. Our primary goal is to generate and sustain an environment of creative ins piration and excellence in creation, practice, and appreciation of the performing arts. Framed by the University's motto "Let Knowledge Serve the City," the School presents a wide spectrumof activities by students, faculty, and guest artists which enhance the artistic and culturallife of the city of Portland.
We offer a comprehensive array of options for emerging artists, with ten distinct undergraduate degrees including five profes sional options and four distinct graduate programs. Our dedicated faculty are internationally recognized performers, conductors, composers, directors, play wrights, designers, and scholars. The School embraces the dual goals of open access and outstanding achievement to produce graduates who make a significant impact in the performing arts regionally and beyond.

## Racial Justice statement

The Portland State University School of Music \& Theater is a deeply engaged collective of performers, creators, and scholars dedicated to student success. We are acutely aware that the status quo in the performing arts, on stage and in the clas sroom, exhibits characteristics of systemic racismand colonialism, and advances the privilege of white men of European descent.

We recognize that simply inviting members of BIPOC communities to participate in a curriculumcentered on European traditions is not enough. While we offer nonwestern ensembles and dedicated clas ses exploring literature outside the European canon, we are seeking ways to expand and deepen these offerings so that they forma more central part of our academic programs. Additionally, we are engaged in revising and restructuring our scholarly and performance offerings to includeBIPOC individuals as fully active and equally represented participants in our institution. This pledge includes examining our hiring practices in order to build a diversecommunity that is representative of the world we wish to live and teach in.

The administration, faculty and staff of our School are committed to enacting meaningful change with clear and unified goals. We are working towards creating and sustaining a diverse community that celebrates difference, including race, culture, gender, sexuality, age, religion, and ability. We are also invested in promoting consequential dis course that amplifies the voices of those in our community who are marginalized, both historically and presently, in order to shape an equitable vision for our community.

## Undergraduate programs

The School of Music \& Theater is located within the hub of musical and theatrical activity in the Pacific Northwest, only three blocks fromthe Portland Center for the Performing Arts. It maintains close ties to the Oregon Symphony, Portland Opera, Portland Jazz Orchestra, Portland Piano International, Portland Youth Philharmonic, Chamber Music Northwest, Oregon Repertory Singers, Artists Repertory Theater, Portland CenterStage, Milagro Theatre, and Third Rail Repertory Theater, among other organizations. Faculty and students alike interact with these performing organizations in various ways.

Students have the opportunity to study with faculty members who are internationally recognized performers, conductors, composers, actors, directors, writers, and scholars. Stand ards are high as students pursue the conservatory-like Bachelor of Music degree or the more general Bachelor of Arts or Science in Music or Theater. Graduates have consis tently demonstrated their excellence in the fields of performance, conducting, composition, acting, writing, production, and scholarship. Many are leaders in music, theater, and education around the Northwest andelsewhere.
Programs in the School of Music \& Theater are accredited by the National Association of Schools of Music and National Association of Schools of Theater. Graduates have gained admis sion to both university graduate programs and professional training programs; they have become teachers and university professors; and they have pursued a range of related professions in the arts, education, business, adminis tration, law, social services, and non-profit management.

## DEGREE MAPS AND LEARNING OUTCOMES

To view the degree maps andexpected learning outcomes for the College of the Arts' undergraduate degrees, go to https://www.pdx.edu/academic-programs/a-z.

## ADMISSIONS REQUIREMENT

Admission to the School is based on general admission to the Univers ity. (See "Admis sion requirements (p. 8)" for
more information.) Additionally, students seeking a B.A./B.S., B.M., or minor in Music (except for the B.A./B.S. in Theater Arts, the B.A./B.S. in Sonic Arts \& Music Production, and the Minor in Music History) need to apply to the School and audition before they are accepted into the music program. See the School of Music \& Theater website for application and audition requirements and deadlines.

## DEGREE REQUIREMENTS

All courses used to satisfy the School of Music \& Theater major and minor requirements, whether taken in the School or else where, must be graded Cor above. Courses taken under the undifferentiated grading option (pass/nopass) will not be accepted toward fulfilling department major requirements. Seventy-two (72) upper-division credits are required for all Baccalaureate degrees in the School of Music \& Theater. In all degrees where upper division applied music is required, students must pass the mandatory upper division examination.
Admission to the B.M. in Music Education programor the B.M. in Composition program, and the B.A./B.S. in Sonic Arts and Music Production is contingent on a mandatory upper-division portfolio review.

## MUSIC: MUSICOLOGY/ETHNOMUSICOLOGY B.A./B.S.

## ProgramCoordinator: J. Schiff

Serving students who seek a broad liberal arts degree with a major in music, the B.A./B.S. in Music:
Musicology/Ethnomusicology provides a music foundation with an emphas is in musicology within a broad liberal arts framework. Students take advanced coursework in music history and world music and receive direct mentorship from faculty as they complete a final research project. Students successfully completing the B.A. or B.S. in Music: Musicology/Ethnomusicology will have gained the neces sary skills in musicology and supportive curriculum to prepare themfor continued academic study in the discipline, along with the breadth of knowledge, critical thinking and expressive skills thatcan be translated to a wide variety of music-related fields and occupations.

## REQUIREMENTS

## Courses

In addition to meeting the general University degree requirements, music majors seeking theB.A. or B.S. in Musicology/Ethnomusicology must complete the following courses:
Mup 190 Applied Music 3
Mup 290 Applied Music 3
Mus $046 \quad 0$
Mus 047 Final Project 0

| Mus 111 | Music Theory I | 3 |
| :---: | :---: | :---: |
| Mus 112 | Music Theory II | 3 |
| Mus 113 | Music Theory III | 3 |
| Mus 114 | Sight Singing/Ear Training I | 1 |
| Mus 115 | Sight Singing/Ear Training II | 1 |
| Mus 116 | Sight Singing/Ear Training III | 1 |
| Mus 188 | Performance Attendance <br> (9 terms required) | 0 |
| Mus 194 | ChamberMusic | 1 |
| Mus 195, | Large Ensemble:Band, | 5 |
| 196, 197, or | Orchestra, Choir, or Jazz Lab |  |
| 198 | Band |  |
| Mus 205 | Listening I | 1 |
| Mus 206 | Listening II | 1 |
| Mus 211 | Music Theory IV | 3 |
| Mus 212 | Music Theory V | 3 |
| Mus 213 | Music Theory VI | 3 |
| Mus 214 | Sight Singing/Ear Training IV | 1 |
| Mus 215 | Sight Singing/ Ear Training V | 1 |
| Mus 216 | Sight Singing/Ear Training VI | 1 |
| Mus 304 | Music History:Medieval, Renais sance, and Baroque | 4 |
| Mus 305 | Music History: Classical and Romantic | 4 |
| Mus 306 | Music History: 20th Century | 4 |
| Mus 470 | Topics in Music History | 2 |
| Two of the following (8 credits) |  |  |
| Mus 374U | World Music: Africa and the Middle East | 4 |
| Mus 375U | World Music: Asia | 4 |
| Mus 376U | American Musical Traditions | 4 |
| Mus 377U | World Music: Latin America and the Caribbean | 4 |
|  | Upper-division music electives to be chosen by student in consultation with an advisor | 6 |
| Subtotal: 66 |  |  |
| Mus 114- Mus 116: (concurrent enrollment with Mus 111, Mus 112, Mus 113 required) |  |  |

Mus 214- Mus 216: (concurrent enrollment with Mus 211, Mus 212, Mus 213 required)

Music majors must enroll in Applied Music and the appropriate Large Ensemble each termuntil requirements are met.

In the Spring termof their sophomore year, interested students will submit a letter of interest, writing sample ( 2500 words ), and current DARS report with a minimum cumulative GPA of 3.0.

All candidates for this degree must complete a final project approved by the Musicology ProgramCoordinator. The project may be one of the following: 1) Research Paper
(15-20 pages), 2) Paper Presentation with Performance, or 3) Video Critique of a current musical event.

## MUSIC: THEORY B.A./B.S.

ProgramCoordinator: B. Hansen
Serving students who seek a broad liberal arts degree with a major in music, the B.A./B.S. in Music: Theory provides a music foundation with an emphasis in theory within a broad liberal arts framework. Students take advanced coursework in music theory and receive direct mentorship from faculty as they complete a final analytical or creative project. Students successfully completing the B.A. orB.S. in Music: Theory will have gained the necessary skills in music theory and supportive curriculumto prepare them for continued academic study in the discipline, along with the breadth of knowledge, critical thinking and expressive skills that can be translated to a wide variety of musicrelated fields and occupations.

## REQUIREMENTS

In addition to meeting the general University degree requirements, music majors seeking theB.A. or B.S. in Music Theory must complete the following courses:

| Courses |  |  |
| :---: | :---: | :---: |
| Mup 190 | Applied Music | 3 |
| Mup 290 | Applied Music | 3 |
| Mus 046 | Piano Proficiency Exam | 0 |
| Mus 047 | Final Project | 0 |
| Mus 111 | Music Theory I | 3 |
| Mus 112 | Music Theory II | 3 |
| Mus 113 | Music Theory III | 3 |
| Mus 114 | Sight Singing/Ear Training I |  |
| Mus 115 | Sight Singing/Ear Training II |  |
| Mus 116 | Sight Singing/Ear Training III |  |
| Mus 188 | Performance Attendance <br> ( 9 terms required) | 0 |
| Mus 194 | Small Ensemble | 1 |
| Mus 195, | Large Ensemble: Band, | 5 |
| 196, 197, or | Orchestra, Choir, or Jazz Lab |  |
| 198 | Band |  |
| Mus 205 | Listening I |  |
| Mus 206 | Listening II | 1 |
| Mus 211 | Music Theory IV | 3 |
| Mus 212 | Music Theory V | 3 |
| Mus 213 | Music Theory VI | 3 |
| Mus 214 | Sight Singing/Ear Training IV | 1 |
| Mus 215 | Sight Singing/Ear Training V |  |
| Mus 216 | Sight Singing/Ear Training VI | 1 |
| Mus 304 | Music History:Medieval, Renaiss ance, and Baroque | 4 |
| Mus 305 | Music History: Classical and | 4 |
| Mus 306 | Music History: 20th Century | 4 |
| Mus 311 | Formal Analys is | 3 |


| Mus 312 | Orchestration | 3 |
| :--- | :--- | :--- |
| Mus 313 | Counterpoint | 3 |
| Mus 421 | Analysis of Contemporary Music <br> or | 3 |
| Mus 422 | Analytical Techniques | 3 |
|  | Upper-division music electives to <br> be chosen by student in <br> consultation with an advisor | 4 |
| Subtotal:66 |  |  |

Mus 114- Mus 116: (concurrent enrollment with Mus 111, Mus 112, Mus 113 required)

Mus 214- Mus 216: (concurrently enrollment with Mus 211, Mus 212, Mus 213 required)
Music majors must enroll in Applied Music and the appropriate Large Ensemble each termuntil requirements are met.

Interested students will submit a sample of their analytical work for admittance to the major after completing Music Theory II or upon transferring to PSU. Students must meet GPA requirement of 3.0 and minimum grades of $B$ in all theory and sight singing/ear training classes.
All candidates for this degree must complete a final project approved by the Theory ProgramCoordinator. The project may be one of the following: 1) Extensive analysis of a composition or 2) Performance of a composition transcribed fromone mediumto another.

## MUSIC: PERFORMANCE B.A./B.S.

Serving students who seek a broad liberal arts degree with a major in music, the B.A./B.S. in Music: Performance provides a music foundation with an emphasis in performance within a broad liberal arts framework. Students receive individualized instruction in applied lessons, participate in large ensembles, and performa culminating recital. Students successfully completing the B.A. or B.S. in Music:Performance will have gained the neces sary skills in music performance and supportive curriculumto prepare themfor continued academic study in the discipline, along with the breadth of knowledge, critical thinking and expressive skills that can be translated to a wide variety of music-related fields and occupations.

## REQUIREMENTS

In addition to meeting the generalUniversity degree requirements, music majors seeking theB.A. or B.S. in Performance must complete the following courses:

## Courses

Mup 190 Applied Music
Mup 290
Applied Music

| $\operatorname{Mup}_{490} 390$ or | Applied Music | 6 |
| :---: | :---: | :---: |
| Mus 046 | Piano Proficiency Exam | 0 |
| Mus 047 | Final Project or | 0 |
| Mus 048 | Junior Recital | 0 |
| Mus 111 | Music Theory I | 3 |
| Mus 112 | Music Theory II | 3 |
| Mus 113 | Music Theory III | 3 |
| Mus 114 | Sight Singing/Ear Training I | 1 |
| Mus 115 | Sight Singing/Ear Training II | 1 |
| Mus 116 | Sight Singing/EarTraining III | 1 |
| Mus 188 | Performance Attendance (9 terms required) | 0 |
| Mus 195, | Large Ensemble: Band, | 6 |
| 196, 197, or | Orchestra, Choir, or Jazz Lab |  |
| 198 | Band |  |
| Mus 205 | Listening I | 1 |
| Mus 206 | Listening II | 1 |
| Mus 211 | Music Theory IV | 3 |
| Mus 212 | Music Theory V | 3 |
| Mus 213 | Music Theory VI | 3 |
| Mus 214 | Sight Singing/EarTraining IV | 1 |
| Mus 215 | Sight Singing/ Ear Training V | 1 |
| Mus 216 | Sight Singing/EarTraining VI | 1 |
| Mus 304 | Music History:Medieval, Renaiss ance, and Baroque | 4 |
| Mus 305 | Music History: Classical and Romantic | 4 |
| Mus 306 | Music History: 20th Century | 4 |
| Mus 351 | Accompanying (For piano majors in lieu of 2 credits of Mus 395, 396, or 397) | 2 |
| Mus 394 | Chamber Music | 1 |
| Mus 395, | Large Ensemble: Band, | 5 |
| 396, 397, or | Orchestra, Choir, or Jazz Lab |  |
| 398 | Band |  |
|  | Upper-division music electives to be chosen by student in consultation with an advisor | 4 |

Subtotal: 66
Mus 114- Mus 116: (concurrent enrollment with Mus 111, Mus 112, Mus 113 required)
Mus 214- Mus 216: (concurrent enrollment with Mus 211, Mus 212, Mus 213 required)
Music majors must enroll in Applied Music and the related Large Ensemble each term.

Candidates for this degree mustcomplete a final project consisting of one of the following: 1) Half recital(30
minutes ), 2) Performance project, or 3) Regular performances on area recitals.

## SONIC ARTS AND MUSIC PRODUCTION (SAMP) B.A./B.S.

ProgramCoordinator: A. Willette
Serving students who seek a broad liberal arts degree with a major in music, the B.A./B.S. in Music: Sonic Arts \& Music Production provides a music foundation with an emphasis in music technology within a broad liberal arts framework. Students engage multiple creative contexts including recording, mixing and mastering, working with visual media, live interactive performance, sound installations, and online possibilities. Students successfully completing the B.A. or B.S. in Music: Sonic Arts \& Music Production will have gained the necessary skills in music technology and supportive curriculum to prepare themfor continued academic study in the discipline along with the breadth of knowledge, creative thinking, and expressive skills that can be translated to artistic, technical, entrepreneurial, and research endeavors.

## REQUIREMENTS

In addition to meeting the general University degree requirements, music majors seeking theB.A. orB.S. in Sonic Arts and Music Production mustcomplete the following courses:

## Courses

Mus 045
Portfolio Review
Mus 101 Contemporary Music Theory I
Mus 102 Contemporary Music Theory II
Mus 103 Contemporary Music Theory III
Mus 188 Performance Attendance (6 terms required)
Mus 191 Group Less ons for Beginners I:
Piano, Guitar or Voice
Mus 192 Group Lessons for Beginners II:
Piano, Guitar or Voice
Mus 193 Group Lessons for Beginners III:
Piano, Guitar or Voice
Mus 194, Small or Large Ensemble
195, 196,
197, or 198
Mus 145
Music Technology Lab (3 terms required)
Mus 245 SAMP I: Audio Recording
Mus 246 SAMP II: Studio Techniques 3
Mus 247 SAMP III: Studio Production
Mus 344 Sonic Arts and Music Production
Laptop Ensemble
(3 terms required)
Mus 345

Mus 346

Mus 347
Mus 445
Mus 476

SAMPV: Music with Visual Media

Two of the following ( 8 credits)
Mus 301U Survey of Music Literature I
Medieval to Classical Era
Mus 302U Survey of Music Literature II:
Romantic to Modern Era
Mus 355U Jazz History
4
Mus 365U Film Music 4
Mus 374U World Music: Africa and the 4
Middle East
Mus 375U World Music: Asia
Mus 376U American Musical Traditions 4
Mus 377U World Music:Latin America and the Caribbean

Upper-division music electives
to be chosen by student in consultation with an advisor.
Subtotal: 66
Interes ted students will submit two creative projects and a written statement of purpose for acceptance as a SAMP major after completing Contemporary Music Theory and Mus 247 or upon transferring to PSU with equivalent coursework.

THEATER ARTS B.A./B.S.
Area Coordinator: K. Magaldi
Serving students who seek a broad liberal arts degree with a major in theater, theB.A./B.S. in Theater Arts provides students with training in performance, design and production, practice, and dramatic literature and theater history. These basic skills are developed in the core requirements. The remaining credits are met through a selected option, performance, design/production, or theater studies including criticis $m$, literature and dramatic writing, which provides for flexibility and allows a student to specialize in an area of interest.

## REQUIREMENTS

In addition to meeting the general University degree requirements, the Major in Theater Arts must complete 68 adviser-approved theater arts credits to include the following:

## 38 Core Credits

TA 111 Stagecraft I 3
TA 112 Stagecraft II 3
TA 114 Technical Theater Production I
TA 115 Technical Theater Production II

| TA 121 | Introductionto Designfor Theater | 4 |
| :---: | :---: | :---: |
| TA 151 | Introduction to Theater Arts \& Practice | 4 |
| TA 201 | Script Analysis | 4 |
| TA 248 | Acting I: Process | 4 |
| TA 316 | Technical Theater Lab | 2 |
| TA 363 | Development of Dramatic Art I | 4 |
| TA 364 | Developmentof Dramatic Art II | 4 |
| TA 454 | Directing I | 4 |
| 8 credits chosen from the following: |  |  |
| TA | History of Dress I | 4 |
| $\begin{aligned} & 322 \mathrm{U} / \mathrm{Art} \\ & 322 \mathrm{U} \end{aligned}$ |  |  |
| TA | History of Dress II | 4 |
| 323U/Art |  |  |
| 323 U |  |  |
| TA 330U | Multicultural Theater | 4 |
| TA 369U | Women, Theater, and Society | 4 |
| TA 467 | Modern Theater I | 4 |
| TA 468 | Modern Theater II | 4 |
| TA 471 | TheaterHistory:Periods and Topics | 1-4 |
| TA 472 | Theater History: Major Figures | 1-4 |
| 2 credits of the following: |  |  |
| TA 333 | Workshop Theater: | 1-2 |
|  | Directing/Stage |  |
|  | Management/Dramaturgy |  |
| TA 334 | Workshop Theater: Scenery, | 1-2 |
|  | Costume \& Lighting Production3 |  |
| TA 335 | Workshop Theater: | 1 |
|  | Management/Publicity |  |

with a maximum of 3 credits in any of the 300 workshops. Workshop credits in excess of this maximum may be used to satisfy elective and general requirements.

## 20 credits of the Theater Electives

20 elective credits fromthe theater curriculumincluding Jpn 422, Traditional Japanese Drama, with at least 12 credits at the 300 level or above.

Courses taken under the undifferentiated grading option (pass/no pass) will not be accepted toward fulfilling department major requirements. All courses used to satisfy the major requirements must be graded Cor above.

At least 20 credits of upper-division Theater Arts courses, including a minimum of 2 credits fromTA 333, TA 334 and TA 335 must be taken in residence at Portland State University.
Subtotal: 68

## COMPOSITION B.M.

Area Coordinator: B. Miksch

Serving students who seek a professional degree in music with an emphas is in music composition, theB.M. in Composition provides a thorough music foundation with specialized coursework in composition, analysis, orches tration, counterpoint, and computer music. Students receive individualized instruction in composition lessons and prepare live performances of their music in concerts and recitals. Students successfully completing the B.M. in Composition will have gained the necessary skills in composition and supporting curriculumto prepare themfor continued academic study or to pursue professional work in composition, generally with teaching or performing as a secondary area.

## REQUIREMENTS

In addition to meeting the general University degree requirements, music majors seeking the professional music degree (Bachelor of Music in Composition) must complete the following courses:
Courses

| Mup 190 | Applied Music Performance | 6 |
| :---: | :---: | :---: |
| Mup 290 | Applied Music Performance | 6 |
| Mup 390 | Applied Music Composition | 6 |
| Mup 490 | Applied Music Composition | 6 |
| Mus 046 | Piano Proficiency Exam | 0 |
| Mus 048 | Junior Recital | 0 |
|  | (30 minutes minimum) |  |
| Mus 049 | SeniorRecital | 0 |
|  | (30 minutes minimum) |  |
| Mus 111 | Music Theory I | 3 |
| Mus 112 | Music Theory II | 3 |
| Mus 113 | Music Theory III | 3 |
| Mus 114 | Sight Singing/EarTraining I | 1 |
| Mus 115 | Sight Singing/Ear Training II | 1 |
| Mus 116 | Sight Singing/Ear Training III | 1 |
| Mus 188 | Performance Attendance (9 terms required) | 0 |
| Mus 195, | Large Ensemble: Band, | 6 |
| 196, 197, or | Orchestra, Choir, or Jazz Lab |  |
| 198 | Band |  |
| Mus 205 | Listening I | 1 |
| Mus 206 | Listening II | 1 |
| Mus 211 | Music Theory IV | 3 |
| Mus 212 | Music Theory V | 3 |
| Mus 213 | Music Theory VI | 3 |
| Mus 214 | Sight Singing/Ear Training IV | 1 |
| Mus 215 | Sight Singing/ Ear Training V | 1 |
| Mus 216 | Sight Singing/Ear Training VI | 1 |
| Mus 240 | Composition I | 2 |
| Mus 241 | Composition II | 2 |
| Mus 242 | Composition III | 2 |
| Mus 291 | Advanced Class Piano I | 2 |
| Mus 292 | Advanced Class Piano II | 2 |
| Mus 293 | Advanced Class Piano III | 2 |



Mus 114- Mus 116: concurrent enrollment with Mus 111, 112, 113 required
Mus 214- Mus 216: concurrent enrollment with Mus 211, 212, 213 required
Music majors must enroll in Applied Music and the related Large Ensemble each term. Students mustearn 6 credits at each levelof Applied Music. With School approval, the dis tribution of Applied Music credits may be altered; however, a minimum of 12 of the 24 credits must be completed at the upper-division level. A minimum of 3 of the 9 Ensemble credits must be completed at the upperdivision level.
Music majors must enroll in the related ChamberMusic Ensemble.

NOTE: Applied Music performance (instrumental or vocal) through Mus 290 with 12 accumulated credits is required. Interested students will submit a portfolio of compositions for acceptance as a Composition Major after the Mus 240, Mus 241, Mus 242 sequence. Transfer students may be admitted on the basis of their portfolio of compositions and their transcript. Portfolio review begins in the Spring for the following academic year.
Subtotal: 123

Total Credit Hours: 123
JAZZ STUDIES B.M.

## Area Coordinator: G. Colligan

Serving students who seek a professional degree in music with an emphas is in jazz, the B.M. in Jazz Studies provides a thorough music foundation with specialized coursework in jazz performance, improvisation, jazzhistory, and arranging. Students pursue immersive jazz performance experiences in large ensembles and jazz combos and solo performances in their recitals. Students successfully completing the B.M. in Jazz Studies will have gained the neces sary skills and confidence to pursue professional work as a jazz musician.

## REQUIREMENTS

In addition to meeting the general University degree requirements, music majors seeking the professional music degree (Bachelor of Music in Jazz Studies) must complete the following courses:
Courses
Mup $190 \quad$ Applied Music 6
Mup $290 \quad 6$
Mup $390 \quad$ Applied Music 6
Mup $490 \quad$ Applied Music 6
Mus $046 \quad 0$
Mus 048 JuniorRecital 0
(30 minutes minimum)
SeniorRecital
Mus $049 \quad \begin{aligned} & \text { SeniorRecital } \\ & \\ & \text { (60 minutes minimum) }\end{aligned}$
Mus 111 Music Theory I 3
Mus 112 Music Theory II 3
Mus 113 Music Theory III 3
Mus $114 \quad$ Sight Singing/Ear Training I 1
Mus $115 \quad$ Sight Singing/Ear Training II 1
Mus $116 \quad$ Sight Singing/Ear Training III 1
Mus 188 Performance Attendance 0
(9 terms required)
Mus 198 Jazz Lab Band 6
Mus 205 Listening I 1
Mus 206 Listening II 1
Mus $211 \quad$ Music Theory IV 3
Mus 212 Music Theory V 3
Mus 213 Music Theory VI 3
Mus $214 \quad$ Sight Singing/Ear Training IV 1
Mus $215 \quad$ Sight Singing/ Ear Training V 1
Mus 216 Sight Singing/Ear Training VI 1
Mus 271 Jazz Improvisation I 2
Mus 272 Jazz Improvisation II 2
Mus 273 Jazz Improvisation III 2
Mus $291 \quad$ Advanced Class Piano I 2
Mus 292 Advanced Class Piano II 2
Mus 293 Advanced Class Piano III 2

| Mus 304 | Music History: Medieval, Renaissance, and Baroque | 4 |
| :---: | :---: | :---: |
| Mus 305 | Music History: Classical and Romantic or | 4 |
| Mus 306 | Music History: 20th Century | 4 |
| Mus 320 | Fundamentals of Conducting | 2 |
| Mus 355U | Jazz History | 4 |
| Mus 374U | World Music: Africa and the Middle East | 4 |
| Mus 375U | or | 4 |
|  | or |  |
| Mus 377U | World Music: Latin America and the Caribbean | 4 |
| Mus 394 | ChamberMusic | 6 |
| Mus 398 | Jazz Lab Band | 6 |
| Mus 470 | Topics in Music History | 2 |
| Mus 424 | Instrumental Jazz Arranging I | 2 |
| Mus 425 | Instrumental Jazz Arranging II | 2 |
| Mus 426 | Instrumental Jazz Arranging III | 2 |
| Mus 471 | Advanced Jazz Improvisation I | 2 |
| Mus 472 | Advanced Jazz Improvis ation II | 2 |
| Mus 473 | Advanced Jazz Improvis ation III | 2 |
| Mus 474 | Midi Applications | 2 |
|  | Music electives to be chosen by student in consultation with an advisor | 9 |

Subtotal: 123
Mus 114-Mus 116: (concurrent enrollment with Mus 111, Mus 112, Mus 113 required)

Mus 214- Mus 216: (jazz section), concurrent enrollment with Mus 211, Mus 212, Mus 213 required.

Music majors must enroll in Applied Music and the related Large Ensemble each term. Students mustearn 6 credits at each levelof Applied Music. With School approval, the dis tribution of Applied Music credits may be altered; however, a minimum of 12 of the 24 credits must be completed at the upper-division level. A minimum of 6 of the 12 Large Ensemble credits must be completed at the upper-division level.
Music majors must enroll in the appropriate Chamber Music Ensemble.

## MUSIC EDUCATION B.M.

ProgramCoordinator: D. Glaze
Serving students who seek a professional degree in music with an emphasis in music education, the B.M. in Music student in consultation with an advisor
with

Education provides a thorough music foundation with specialized coursework in instrumental and vocal methods, conducting, rehearsal techniques, orchestration, and literature. Students train to become music teachers in the K-12 setting and choose between our choral and instrumental music education tracks. Students successfully completing the B.M. in Music Education will have gained the necessary skills to pursue graduate teacher certification and placement as a music teacher in the public school system.

## REQUIREMENTS

In addition to meeting the general University degree requirements, music majors seeking the professional music degree (Bachelor of Music in Music Education) must complete the following courses:

| Courses |  |  |
| :---: | :---: | :---: |
| Mup 190 | Applied Music | 3 |
| Mup 290 | Applied Music | 3 |
| Mup 390 or | Applied Music | 6 |
| MuEd 045 | Music Education Degree Entry Portfolio | 0 |
| Mus 046 | Piano Proficiency Exam | 0 |
| $\begin{aligned} & \text { Mus } 047 \text { or } \\ & 048 \end{aligned}$ | Final Project or Junior Recital | 0 |
|  | (30 minutes minimum) |  |
| Mus 111 | Music Theory I | 3 |
| Mus 112 | Music Theory II | 3 |
| Mus 113 | Music Theory III | 3 |
| Mus 114 | Sight Singing/Ear Training I | 1 |
| Mus 115 | Sight Singing/Ear Training II | 1 |
| Mus 116 | Sight Singing/Ear Training III | 1 |
| Mus 188 | Performance Attendance <br> ( 9 terms required) | 0 |
| Mus 195, | Large Ensemble: Band, | 6 |
| 196, 197, or | Orchestra, Choir, or Jazz Lab |  |
| 198 | Band |  |
| Mus 205 | Listening I | 1 |
| Mus 206 | Listening II | , |
| Mus 211 | Music Theory IV | 3 |
| Mus 212 | Music Theory V | 3 |
| Mus 213 | Music Theory VI | 3 |
| Mus 214 | Sight Singing/Ear Training IV | 1 |
| Mus 215 | Sight Singing/Ear Training V | 1 |
| Mus 216 | Sight Singing/Ear Training VI | 1 |
| Mus 291 | Advanced Class Piano I | 2 |
| Mus 292 | Advanced Class Piano II | 2 |
| Mus 293 | Advanced Class Piano III | 2 |
| Mus 304 | Music History: Medieval, Renaiss ance, and Baroque | 4 |
| Mus 305 | Music History: Classical and Romantic | 4 |
| Mus 306 | Music History: 20th Century | 4 |
| Mus 312 | Orchestration | 3 |


| Mus 320 | Fundamentals of Conducting | 2 |
| :--- | :--- | :--- |
| Mus 321 | InstrumentalConducting | 2 |
| Mus 322 | Choral Conducting | 2 |
| MuEd 328 | Introductionto Music Education | 2 |
| MuEd 332 | String Techniques | 1 |
| MuEd 333 | Guitar Techniques | 1 |
| MuEd 334 | Vocal Techniques K-12 | 1 |
| MuEd 335 | Percussion Techniques | 1 |
| Mus 395, | Large Ensemble: Band, | 6 |
| 396, 397, or | Orchestra, Choir, or Jazz Lab |  |
| 398 | Band | 2 |
| Mus 409 | Practicum | 2 |
| Mus 470 | Topics in Music History | 2 |
| Mus 474 | Midi Applications |  |
| MuEd 484 | Music with Children | 3 |
| One of the following: |  |  |
| Mus 374U | World Music: Africa and the <br> Mus 375U | Middle East <br> World Music: Asia |
| Mus 377U | World Music:Latin America and <br> the Caribbean | 4 |

Mus 114-Mus 116: (concurrent enrollment with Mus 111, Mus 112, Mus 113 required)
Mus 214-Mus 216: (concurrent enrollment with Mus 211, Mus 212, Mus 213 required)
Music majors must enroll in Applied Music and the related Large Ensemble each term. Students mustearn 3 credits at each levelof Applied Music. With School approval, the dis tribution of Applied Music credits may be altered; however, a minimum of 6 of the 12 must be completed at the upper-division level. A minimum of 6 of the 12 Large Ensemble credits must be completed at the upper-division level.
Additionally, students need to choose a teaching subspeciality and complete the following courses in the appropriate track:

## Instrumental Track

| Mus 197 | Chorus | 1 |
| :--- | :--- | :--- |
| Mus 397 | Chorus | 1 |
| Mus 409 | Marching Band Practicum | 1 |
| MuEd 336 | Flute and Double Reeds | 1 |
| MuEd 337 | Clarinet and Saxophone | 1 |
| MuEd 338 | High Brass Techniques | 1 |
| MuEd 339 | Low Brass Techniques | 1 |
| MuEd 341 | Jazz Techniques | 1 |
| MuEd 422 | InstrumentalLiterature and | 3 |
|  | Rehearsal Techniques I |  |
| MuEd 423 | InstrumentalLiterature and | 3 |
|  | RehearsalTechniques II |  |
|  | Instrumental TrackMusic | 13 |
|  | Electives |  |


| Choral/General Track |  |  |
| :--- | :--- | ---: |
| Mus 397 | Chorus | 1 |
| MuEd 480, | Kodály Training: Level I, II, or | 5 |
| 481, or 482 | III |  |
| MuEd 340 | Wind Instrument Techniques | 3 |
| MuEd 420 | ChoralLiterature and Rehearsal | 3 |
|  | Techniques I |  |
| MuEd 421 | ChoralLiterature and Rehearsal | 3 |
|  | Techniques II |  |
|  | ChoralTrackMusic Electives | 12 |

TotalTeaching Sub-Specialty Credits: 27
Subtotal: 123
PERFORMANCE B.M.
Serving students who seek a professional degree in music with an emphas is in performance, the B.M. in Performance provides a thorough music foundation with specialized coursework in classical instrumental performance, keyboard skills, music theory, and pedagogy. Students pursue immersive performance experiences in large ensembles and chamber ensembles and solo performance in their recitals. Students successfully completing the B.M. in Performance will have gained the necessary skills in performance and supporting curriculumto prepare them for continued academic study or to pursue professional work as a performer generally with teaching as a secondary area.

## REQUIREMENTS

In addition to meeting the general University degree requirements, music majors seeking the professional music degree (Bachelor of Music in Performance) must complete the following courses:

| Courses |  |  |
| :--- | :--- | :--- |
| Mup 190 | Applied Music | 6 |
| Mup 290 | Applied Music | 6 |
| Mup 390 | Applied Music | 6 |
| Mup 490 | Applied Music | 6 |
| Mus 046 | Piano Proficiency Exam | 0 |
| Mus 048 | Junior Recital | 0 |
|  | (30 minutes minimum) |  |
| Mus 049 | Senior Recital <br> (60 minutes minimum) | 0 |
| Mus 111 | Music Theory I | 3 |
| Mus 112 | Music Theory II | 3 |
| Mus 113 | Music Theory III | 3 |
| Mus 114 | Sight Singing/EarTraining I | 1 |
| Mus 115 | Sight Singing/EarTraining II | 1 |
| Mus 116 | Sight Singing/EarTraining III | 1 |
| Mus 188 | Performance Attendance | 0 |
| Mus 194\& | (9 terms required) |  |
| Chamber Music | 6 |  |
| 394 |  |  |


|  | (minimum 3 upper division credits) |  |
| :---: | :---: | :---: |
| Mus 195, | Large Ensemble: Band, | 6 |
| 196, or 197 | Orchestra, or Chorus |  |
| Mus 205 | Listening I | 1 |
| Mus 206 | Listening II | 1 |
| Mus 211 | Music Theory IV |  |
| Mus 212 | Music Theory V | 3 |
| Mus 213 | Music Theory VI | 3 |
| Mus 214 | Sight Singing/Ear Training IV | 1 |
| Mus 215 | Sight Singing/ Ear Training V |  |
| Mus 216 | Sight Singing/Ear Training VI | 1 |
| Mus 291 | Advanced Class Piano I | 2 |
| Mus 292 | Advanced Class Piano II | 2 |
| Mus 293 | Advanced Class Piano III | 2 |
| Mus 304 | Music History:Medieval, | 4 |
| Mus 305 | Renais ance, and Baroque Music History: Classical and Romantic | 4 |
| Mus 306 | Music History: 20th Century | 4 |
| Mus 311 | Formal Analysis | 3 |
| Mus 312 | Orchestration | 3 |
| Mus 313 | Counterpoint | 3 |
| Mus 320 | Fundamentals of Conducting | 2 |
| Mus 351 | Accompanying (For piano majors in lieu of 2 credits of Mus 395, 396, or 397) | 2 |
| Mus 395, | Large Ensemble: Band, | 6 |
| 396, or 397 | Orchestra, or Chorus |  |
| Mus 470 | Topics in Music History | 2 |
| Mus 481 | Pedagogy | 3 |
| One of the following (4 credits): |  |  |
| Mus 374U | World Music: Africa and the Middle East | 4 |
| Mus 375U | World Music: Asia | 4 |
| Mus 377U | World Music: Latin America and the Caribbean | 4 |
|  | Music electives to be chosen by student in consultation with an advisor | 17 |

## Subtotal: 123

Mus 114-116: (concurrentenrollment with Mus 111, Mus 112, Mus 113 required)

Mus 214-216: (concurrentenrollment with Mus 211, Mus 212, Mus 213 required)
Music majors must enroll in Applied Music and the related Large Ensemble each term. Students mustearn 6 credits at each levelof Applied Music. With School approval, the distribution of Applied Music credits may be altered; however, a minimum of 12 of the 24 must be completed at the upper-division level. A minimum of 6 of the 12 Large Ensemble credits mustbe completed at the upper-division level.

Music majors must enroll in the appropriate Chamber Music Ensemble.

## PERFORMANCE WITH AN EMPHASIS IN VOICE B.M.

ProgramCoordinator: C. Meadows
Serving students who seek a professional degree in music with an emphas is in vocal performance, the B.M. in Performance with an Emphas is in Voice provides a thorough music foundation with specialized coursework in clas sical vocal performance, diction and language study, and pedagogy. Students pursue ensemble performance experiences in choir and solo performanceexperiences in opera and their recitals. Students successfully completing the B.M. in Performance will have gained the necessary skills in performance and supporting curriculumto prepare themfor continued academic study or to pursue professional work as a vocalist.

## REQUIREMENTS

In addition to meeting the general University degree requirements, music majors seeking the professional music degree (Bachelor of Music in Performance with an Emphasis in Voice) must complete the following courses:

## Courses

Mup $190 \quad$ Applied Music 6
Mup $290 \quad$ Applied Music 6
Mup $390 \quad 6$
Mup $490 \quad$ Applied Music 6
Mus 046 Piano Proficiency Exam 0
Mus 048 Junior Recital 0 (30 minutes minimum)
Mus 049
Senior Recital
(60 minutes minimum)
Mus 111
Music Theory I
Mus 112 Music Theory II 3
Mus 113 Music Theory III 3
Mus 114 Sight Singing/EarTraining I 1
Mus 115 Sight Singing/Ear Training II 1
Mus 116 Sight Singing/Ear Training III 1
Mus $188 \quad 0$
(9 terms required)
Mus 197 Chorus
Mus 205 Listening I 1
Mus 206 Listening II 1
Mus $211 \quad 3$
Mus 212 Music Theory V 3
Mus 213 Music Theory VI 3
Mus 214 Sight Singing/Ear Training IV 1
Mus $215 \quad$ Sight Singing/Ear Training V 1
Mus 216 Sight Singing/EarTraining VI 1
Mus $291 \quad$ Advanced Class Piano I 2
Mus 292 Advanced Class Piano II 2

| Mus 293 | Advanced Class Piano III | 2 |
| :---: | :---: | :---: |
| Mus 304 | Music History:Medieval, Renaiss ance, and Baroque | 4 |
| Mus 305 | Music History: Classical and Romantic | 4 |
| Mus 306 | Music History: 20th Century | 4 |
| Mus 320 | Fundamentals of Conducting | 2 |
| Mus 397 | Chorus | 6 |
| Mus 470 | Topics in Music History | 2 |
| Mus 427 | Opera Works hop | 1 |
| Mus 428 | Opera Production | 1-2 |
| Mus 481 | Pedagogy | 3 |
| Mus 485 | Diction forSingers:Italian | 2 |
| Mus 486 | Diction forSingers: German | 2 |
| Mus 487 | Diction for Singers:French | 2 |
| Mus 490 | Fundamentals of Acting for Singers | 3 |
| One of the following (3 credits) |  |  |
| Mus 430 | Song Literature | 3 |
| Mus 436 | Opera Literature | 3 |
| One of the following (4 credits) |  |  |
| Mus 374U | World Music: Africa and the Middle East | 4 |
| Mus 375U | World Music: Asia | 4 |
| Mus 377U | World Music: Latin America and the Caribbean | 4 |
| Two of the following (8 credits) |  |  |
| It 103 | First-Year Italian Term 3 | 4 |
| Fr 103 | First-Year French Term3 | 4 |
| Ger 103 | First-Year German Term3 | 4 |
|  | Music electives to be chosen by student in consultation with advisor | 8 |

Subtotal: 123
Mus 114-Mus 116: (concurrent enrollment with Mus 111, Mus 112, Mus 113 required)
Mus 214-Mus 216: (concurrent enrollment with Mus 211, Mus 212, Mus 213 required)
Music majors must enroll in Applied Music and the related Large Ensemble each term. Students mustearn 6 credits at each levelof Applied Music. With departmental approval, the distribution of Applied Music credits may be altered; however, a minimum of 12 of the 24 credits must be completed at the upper-division level. A minimum of 6 of the 12 Large Ensemble credits must be completed at the upper-division level.

Mus 427: Opera Workshop is a one-credit ensemble. Voice majors are required to take Opera W orkshop twice.

DANCE MINOR

The Dance Minor has been suspended effective Fall 2017, and no applications are being accepted at this time.

## MUSIC MINOR

## REQUIREMENTS

To earn a Minor in Music, a student must complete 30 advisor-approved credits ( 17 credits must be in residence at Portland State University), to include the following:

## Courses

Mup 190 Applied Music 3
Mus 101, Contemporary Music Theory I, 12
102, 103 II, \& III
OR
Mus 111, Music Theory I, II, \& III 9
112, 113
and
Mus 114, Sight-Singing/Ear Training I, II 3
115, 116 \& III
Mus $188 \quad$ Performance Attendance 0
(3 terms required)
Mus 195, Band, Orchestra, Chorus, or Jazz 3
196, 197, or Lab Band
198

One of the following:
Mus 203, Music of the Western World, 4 274, 301, or Introduction to World Music, or 302 Survey of Music Literature

Upper-division Music History, World Music, Popular Music, or Jazz History Course Music Electives
Subtotal: 30
Mus 114-Mus 116: Concurrent enrollment in Mus 111, Mus 112, and Mus 113 is required.
Students who choose to minor in Jazz Performance will take Applied Music in the Jazz Area, Jazz History, and Jazz Lab Band.

## MUSIC HISTORY MINOR

ProgramCoordinator: J. Schiff

## REQUIREMENTS

To earn a Minor in Music History, a student must complete 30 adv is or-approved credits ( 17 credits must be in residence at Portland State University), to include the following:

## Courses

| Mus 101 | Contemporary Music Theory I |
| :--- | :--- |
| Mus 102 | Contemporary Music Theory II <br> Mus 188 |
| Performance Attendance <br> (3 terms required) |  |
| Mus 203, | Music in the Western W orld or |
| 301, or 302 | Survey of Music Literature Ior II |
| Mus 304, | Music History |
| 305, or 306 |  |

Any combination of the following for $\mathbf{1 4}$ credits:
Mus 191 Group Lessons for Beg inners I: Piano, Guitar or Voice
$\begin{array}{ll}\text { Mus } 192 & \begin{array}{l}\text { Group Less ons for Beginners II: } \\ \text { Piano, Guitar or Voice }\end{array} \\ \end{array}$
Mus $193 \quad$ Group Les sons for Beginners III: 2
Piano, Guitar or Voice
Mus 194or ChamberMusic orChorus
(up to 3 credits)
Mus 304 Music History:Medieval, Renaiss ance, and Baroque (if not taken as required)
Mus 305 Music History: Classical and Romantic (if not taken as required)
Mus 306 Music History: 20th Century (if not taken as required)
Mus 355U Jazz History
Mus 356U Jazz And American Culture: How History Shaped Our Music, Then and Now
Mus 360U The Guitar: its History and Music
Mus 361U History of Rock Music I (19501970)

Mus 362U History of Rock Music II (1970Present)
Mus 374U World Music: Africa and the Middle East
Mus 375U World Music:Asia
Mus 376U American Musical Traditions
Mus 377U World Music:Latin America and the Caribbean
Mus $470 \quad$ Topics in Music History (up to 4 credits)
Subtotal:30

## THEATER ARTS MINOR

## ProgramCoordinator: K. Magaldi

To earn a minor in theater arts a student must complete 28 adviser-approvedcredits to include the following:

## REQUIREMENTS

## Graduate programs

Graduate Coordinator: S. Carls on
The School of Music \& Theater offers graduate work in music leading to the degrees of Master of Music (M.M.) in Performance, Master of Music (M.M.) in Conducting, Master of Music (M.M.) in Jazz Studies, as well as a Master of Arts in Music (M.A.) and a Master of Science in Music (M.S.). The M.A./M.S. degrees are general master's degrees in music. Graduate students in music may also pursue recommendation for standard teaching certification. This curriculumdifferentiates between specialis ts in vocal music and instrumental music, but candidates in both areas complete a core of required courses.

## ADMISSION REQUIREMENTS

For admission to graduatestudy the student must hold a bachelor's degree representing a course of study equivalent to that pursued by PSU undergraduates in music.

Students applying to theM.A./M.S. programs must complete an interview and submit one of the following as part of their application process:

1. History Paper
2. Theory Paper, descriptive analysis or composition.
3. Audition Performance demonstrating mastery at the MUP490 level.
4. Teaching Certificate.

Students applying to theM.M. in
Performance/Conducting/Jazz Studies must complete an interview and audition. See the School of Music \& Theater's website at www.pdx.edu/music-theater for specific area requirements.

## All Masters Programs

In addition to meeting the generalrequirements for admis sion to graduate study in the University, each student must successfully take the music placement examination prepared by and administered in the School of Music \& Theater. The placementexamination must be passed or the recommended review course must be passed with a grade of $B$ or better before a student may enroll in a graduate his tory or theory course. All courses used to satisfy graduate requirements, whether taken in the School or elsewhere, must be graded B or above.

MUSIC M.A./M.S. PROGRAM
Serving students who seek a broad graduate degree in music, the M.A./M.S. in Music provides advanced studies in research methods, music theory, music his tory, literature, pedagogy, conducting, and arranging. Students take applied music in their performance area or in composition and in a secondary performance area. Students pursue a culminating project in performance, composition, pedagogy, musicology, ethnomusicology, or mus ic theory. Students successfully completing the M.A./M.S. in Music will have gained the necessary skills to prepare themfor continued study in a doctoral program or to pursue professional work as a teacher, performer, composer, church musician, or related career.

## CORE CURRICULUM

| All of the following: |  |  |
| :--- | :--- | :--- |
| Mus 056 | Graduate Music History Entrance <br> Mus 057 | Exam |
|  | Graduate Music Theory Entrance | 0 |
| Mup 590 | Exam | Applied Music |

$$
\begin{array}{ll}
\text { Ensemble: Chosen with advice of } & 3 \\
\text { graduate faculty }
\end{array} \quad \begin{aligned}
& \text { Education/Pedagogy (chosen } \\
& \text { with adviser's assistance) }
\end{aligned}
$$

Mup 591: (may substitute Mup 590 credits with adviser approval)

## One of the following: ( $\mathbf{2}-\mathbf{3}$ credits)

Mus 522 Advanced Orchestral Arranging 3
Mus 523 Advanced Choral Arranging 3
Mus 524 Instrumental Jazz Arranging I 2
$\begin{array}{ll}\text { One of the following ( } \mathbf{3} \text { credits) } \\ \text { Mus } 530 & \text { Song Literature }\end{array}$
Mus 531 Chamber Music Literature 3
Mus 532 Band Wind Literature 3
Mus 533 OrchestralLiterature 3
Mus 534 Choral Literature I 3
Mus 536 Opera Literature 3
Mus 537 Keyboard Literature I 3
Mus 538 Keyboard Literature II 3
Mus 539 InstrumentalLiterature 3
Mus 540 Jazz Literature 3
Three of the following: ( 6 credits)
Mus $560 \quad$ Music History: The Medieval 2
Mus 561 Music History: The Renaissance 2
Period
Mus 562 Music History: The Baroque 2
Period
Mus 563 Music History: The Classical 2
Period
Mus $564 \quad$ Music History: The Romantic 2
Period
Mus $565 \quad$ Music History: Early 20th 2
Century
Mus 566 Music History: Music Since
2 1950
One of the following (determined in conjunction with advisor) (3 credits)
Mus 541 Advanced Conducting Methods 3
Mus 542 Advanced Choral Conducting 3
Mus 543 Advanced Instrumental 3 Conducting

Elective Studies Selected with an $\quad 9-10$ Advis or
Subtotal: 45
Students must pass Mus 056, the Music History Entrance Exam, before taking any graduate music history course with the exception of Mus 529, Grad History Review. A grade of B orbetter in Mus 529 will constitute a Pass for the Music History Entrance Exam. Similarly, students must pass Mus 057, the Music Theory Entrance Exam, before taking any graduate music theory course with the
exception of Mus 512, Graduate Theory Review. A grade of B or better in Mus 512 will constitute a Pass for the Music Theory Entrance Exam.
All M.A./M.S. candidates must take a final written examination. All graduate students must receive a grade of $B$ or above in music courses.

THEATER ARTS M.A./M.S. PROGRAM

## Advisor: R. Wattenberg

Admis sion to the MA/MS in Theater Arts has been suspended effective fall2015, and no applications are being accepted at this time.

## MASTER OF MUSIC M.M. PROGRAM

## M ASTER OF MUSIC IN PERFORM ANCE

Serving students who seek a professional graduate degree in performance, the M.M. in Performance provides advanced studies in performance, music history, music theory, literature, pedagogy, and research methods. Students pursue immersive performance experiences in large ensembles and chamber ensembles and solo performance in their recitals. Students successfully completing the M.M. in Performance will have gained the neces sary skills to prepare themfor continued study in a doctoral programor to pursue professional work as a performer generally with teaching as a secondary area.
For an M.M. in Vocal Performance consult the School of Music \& Theater for Language Requirement.

| All of the following: |  |  |
| :---: | :---: | :---: |
| Mus 056 | Graduate Music History | 0 |
|  | Entrance Exam |  |
| Mus 057 | Graduate Music Theory Entrance | 0 |
| Mup 590 | Applied Music | 12 |
| Mus 506 | Graduate Project or Recital | 2 |
| Mus 511 | Music Research Methods | 3 |
| Mus 520 | Analytical Techniques | 3 |
| Two of the following: (4 credits) |  |  |
| Mus 560 | Music History:The Medieval Period | 2 |
| Mus 561 | Music History:The Renaissance Period | 2 |
| Mus 562 | Music History: The Baroque Period | 2 |
| Mus 563 | Music History: The Classical Period | 2 |
| Mus 564 | Music History: The Romantic Period | 2 |

Mus 565 Music History: Early 20th
Century

Mus 566 Music History: Music Since
1950

Two of the following: ( 6 credits)
Mus 530 Song Literature
Mus 531 ChamberMusic Literature 3
Mus 532 Band Wind Literature 3
Mus 533 OrchestralLiterature 3
Mus 534 ChoralLiterature I 3
Mus 535 ChoralLiterature II 3
Mus 536 Opera Literature 3
Mus 537 KeyboardLiterature I 3
Mus 538 KeyboardLiterature II 3
Mus 539 Instrumental Literature 3
Mus 540 Jazz Literature 3
One of the following ( 3 credits)
Mus 581 Pedagogy 3
Chosen with advice of graduate faculty: ( $\mathbf{3}$ credits)
Mus 527 Opera Workshop 1
Mus 594 ChamberMusic 1
Mus 595 Band 1
Mus 596 Orchestra 1
Mus 597 Chorus 1
Mus 598 Jazz Lab Band 1
Elective Studies Selected with an 9
Advis or
Students must pass Mus 056, the Music History Entrance Exam, before taking any graduate music his tory course with the exception of Mus 529, Grad History Review. A grade of B orbetter in Mus 529 will cons titute a Pass for the Music History Entrance Exam. Similarly, students must pass Mus 057, the Music Theory Entrance Exam, before taking any graduate music theory course with the exception of Mus 512, Graduate Theory Review. A grade of B or better in Mus 512 will constitute a Pass for the Music Theory Entrance Exam.
All M.M. degree candidates musttake a final oral examination. All graduate students must receive a grade of B or above in music courses.
Subtotal: 45

## M ASTER OF M USIC IN PERFORM ANCE (COLLABORATIVE PIANO)

Serving students who seek a professional graduate degree in performance, the M.M. in Performance (Collaborative Piano) provides advanced studies in accompanying, keyboard techniques, diction, music history, music theory, literature, and research methods. Students pursue immersive performance experiences as collaborative pianists working with soloists, chamber ensembles, choir, opera, and large ensembles. Students successfully completing the M.M. in Performance (Collaborative Piano)
will have gained the necessary skills to prepare themfor continued study in a doctoral programor to pursue profes sional work as a collaborative pianist.

| All of the following: |  |  |
| :---: | :---: | :---: |
| Mup 590 | Applied Music | 12 |
| Mus 056 | Graduate Music History | 0 |
|  | Entrance Exam |  |
| Mus 057 | Graduate Music Theory Entrance | 0 |
|  | Exam |  |
| Mus 506 | Graduate Project or Recital | 1-4 |
| Mus 511 | Music Research Methods | 3 |
| Mus 520 | Analytical Techniques | 3 |
| Mus 550 | Collaborative Piano Literature | 3 |
|  | Strings |  |
| Mus 551 | Collaborative Piano Literature | 3 |
|  | Winds and Brass |  |
| Mus 552 | Advanced Keyboard Techniques | 3 |
| Mus 585 | Diction forSingers: Italian | 2 |
| Mus 586 | Diction forSingers: German | 2 |
| Mus 587 | Diction forSingers:French | 2 |
| Two of the following: (4 credits) |  |  |
| Mus 562 | Music History: The Baroque | 2 |
|  | Period |  |
| Mus 563 | Music History: The Clas sical | 2 |
|  | Period |  |
| Mus 564 | Music History: The Romantic | 2 |
|  | Period |  |
| Mus 565 | Music History: Early 20th | 2 |
|  | Century |  |
| Mus 566 | Music History: Music Since | 2 |
|  | 1950 |  |
| One of the following: (3 credits) |  |  |
| Mus 530 | Song Literature | 3 |
| Mus 536 | Opera Literature | 3 |
| Chosen with advice of graduate faculty: ( $\mathbf{3}$ credits) |  |  |
| Mus 527 | Opera Workshop | 1 |
| Mus 594 | ChamberMusic | 1 |
| Mus 595 | Band | 1 |
| Mus 596 | Orchestra | 1 |
| Mus 597 | Chorus | 1 |

Students must pass Mus 056, the Music History Entrance Exam, before taking any graduate music history course with the exception of Mus 529, Grad History Review. A grade of B or better in Mus 529 will constitute a Pass for the Music History Entrance Exam. Similarly, students must pass Mus 057, the Music Theory Entrance Exam, before taking any graduate music theory course with the exception of Mus 512, Graduate Theory Review. A grade of B or better in Mus 512 will constitute a Pass for the Music Theory Entrance Exam.

All M.M. degree candidates musttake a final oral examination. All graduatestudents must receive a grade of B or above in music courses. Subtotal: 45

## M ASTER OF MUSIC IN CONDUCTING

Serving students who seek a professional graduate degree in conducting, the M.M. in Conducting provides advanced studies in conducting, literature, arranging, mus ic history, music theory, score reading, and research methods. Students specialize in choral or ins trumental conducting and receive hands-on experience conducting choir, orchestra, or band under the mentorship of our faculty. Students successfully completing the M.M. in Conducting will have gained the necessary skills to prepare themfor continued study in doctoral programs or to pursue professional work as a music director working with professional, community, church, or school ensembles.
All of the following:
Mus $056 \quad$ Graduate Music History 0 Entrance Exam
Mus $057 \quad$ Graduate Music Theory Entrance 0 Exam
Mus $506 \quad$ Graduate Project or Recital 2
Mus 511 Music Research Methods 3
Mus 513 Score Reading 3
Mus 520 AnalyticalTechniques 3
$\begin{array}{lll}\text { One of the following: }(\mathbf{3} \text { credits) } & \\ \text { Mus 522 } & \text { Advanced Orchestral Arranging } & 3 \\ \text { Mus 523 } & \text { Advanced Choral Arranging } & 3\end{array}$
One of the following: ( 3 credits)
Mus 532 Band Wind Literature 3
Mus 533 OrchestralLiterature 3
Mus 534 ChoralLiterature I 3
Mus 535 ChoralLiterature II 3
Three of the following ( 9 credits)
Mus 541 Advanced Conducting Methods 3
Mus 542 Advanced Choral Conducting 3
Mus 543 Advanced Instrumental 3
Conducting
Mus 541, Mus 542, and Mus 543: May be taken multiple times.
Two of the following: (4 credits)
Mus $560 \quad$ Music History: The Medieval 2
Mus 561 Music History: The Renaissance 2
Mus 562 Music History: The Baroque 2
Period
Mus 563 Music History: The Classical Period
Mus 564 Music History: The Romantic Period

| Mus 565 | Music History: Early 20th <br> Century | 2 |
| :--- | :--- | :--- |
| Mus 566 | Music History: Music Since <br> 1950 | 2 |
| Chosen with | advice of graduate faculty (6 credits) |  |
| Mus 595 | Band |  |
| Mus 596 | Orchestra | 1 |
| Mus 597 | Chorus |  |
|  | Elective Studies Selected with an | 1 |
|  | Advisor | 1 |

Students must pass Mus 056, the Music History Entrance Exam, before taking any graduate mus ic his tory course with the exception of Mus 529, Grad History Review. A grade of B or better in Mus 529 will constitute a Pass for the Music History Entrance Exam. Similarly, students must pass Mus 057, the Music Theory Entrance Exam, before taking any graduate music theory course with the exception of Mus 512, Graduate Theory Review. A grade of B or better in Mus 512 will constitute a Pass for the Music Theory Entrance Exam.

All M.M. degree candidates must take a finaloral examination. All graduate students must receive a grade of B or above in music courses.
Subtotal: 45

## M ASTER OF MUSIC IN JAZZ STUDIES

Serving students who seek a professional graduate degree in jazz studies, the M.M. in Jazz Studies provides advanced studies in jazz performance, improvis ation, jazz history, literature, arranging, pedagogy, and research methods. Students gain valuable jazz performance experience in large ensembles and develop leadership skills working with jazz combos. Students successfully completing the M.M. in Jazz Studies will have gained the neces sary skills to prepare themfor continued study in a doctoral programor to pursue professional work as a jazz musician generally with teaching as a secondary area.

| All of the following: |  |  |
| :--- | :--- | ---: |
| Mus 056 | Graduate Music History | 0 |
|  | Entrance Exam |  |
| Mus 057 | Graduate Music Theory Entrance | 0 |
|  | Exam | 12 |
| Mup 590 | Applied Music | 2 |
| Mus 506 | Graduate Project or Recital | 3 |
| Mus 511 | Music ResearchMethods | 3 |
| Mus 520 | Analytical Techniques | 3 |
| Mus 526 | Instrumental Jazz Arranging III | 2 |
| Mus 540 | Jazz Literature | 3 |
| Mus 567 | Jazz History | 2 |
| Mus 581 | Pedagogy | 3 |

Mus 520: jazz section

| One of the following (2 credits) |  |  |
| :---: | :---: | :---: |
| Mus 560 | Music History: The Medieval Period | 2 |
| Mus 561 | Music History:The Renaissance Period | 2 |
| Mus 562 | Music History:The Baroque Period | 2 |
| Mus 563 | Music History: The Classical Period | 2 |
| Mus 564 | Music History: The Romantic Period | 2 |
| Mus 565 | Music History: Early 20th Century | 2 |
| Mus 566 | Music History: Music Since 1950 | 2 |
| Complete 3 credits from the following: ( 3 credits) |  |  |
| Mus 594 | ChamberMusic |  |
| Mus 598 | Jazz Lab Band |  |
|  | Elective Studies Selected with Advisor | 10 |

Students must pass Mus 056, the Music History Entrance Exam, before taking any graduate music his tory course with the exception of Mus 529, Grad History Review. A grade of B or better in Mus 529 will constitute a Pass for the Music History Entrance Exam. Similarly, students must pass Mus 057, the Music Theory Entrance Exam, before taking any graduate music theory course with the exception of Mus 512, Graduate Theory Review. A grade of B or better in Mus 512 will constitute a Pass for the Music Theory Entrance Exam.
All M.M. degree candidates musttake a final oral examination. All graduatestudents must receive a grade of B or above in music courses.
Subtotal: 45

## GRADUATE CERTIFICATE IN MUSIC PERFORMANCE

The Graduate Certificate in Music Performance provides students the framework to immerse themselves in applied performance, focusing on private study and ensemble playing. To complement their performance study, students will take additional coursework which can be elected from music literature, pedagogy, his tory, theory, wellness, and business. This certificate is intended as an alternative for students who have completed an undergraduate degree in music and wish to hone their craft in performance at the graduate level without engaging in the complete curriculumrequired in a master's degree.

REQUIREMENTS (14 CREDITS)

| Mus 506 | Graduate Project or Recital | 2 |
| :--- | :--- | :--- |
| MUP 590 | Applied Music | 6 |


| Six credits of the following ensemble credits, chosen <br> with advice of <br> graduate faculty: |  |  |
| :--- | :--- | ---: |
| Mus 527 | Opera Workshop | 1 |
| Mus 528 | Opera Production | $1-2$ |
| Mus 594 | ChamberMusic | 1 |
| Mus 595 | Band | 1 |
| Mus 596 | Orchestra | 1 |
| Mus 597 | Chorus | 1 |
| Mus 598 | Jazz Lab Band | 1 |

## ELECTIVES (12 CREDITS)

Any 500-level Music course may count towards the elective requirement.

## Recommended Courses

| Mus 511 | Music ResearchMethods | 3 |
| :--- | :--- | :--- |
| Mus 512 | Graduate Theory Review | 3 |
| Mus 529 | Grad History Review | 3 |
| Mus 545 | Business of Music | 3 |
| Mus 580 | Body Mapping for Musicians: | 2 |
|  | Anatomy, Physiology, |  |
|  | Movementand Sensory |  |
| Mus 581 | Awareness | Pedagogy |

## Recommended for Instrumentalists

Mus 531 ChamberMusic Literature 3
Mus 533 OrchestralLiterature 3
Mus 537 Keyboard Literature I 3
Mus 538 Keyboard Literature II 3
Mus 539 Instrumental Literature 3
Mus 550 Collaborative Piano Literature 3
Strings
Mus 551 Collaborative Piano Literature 3
Winds and Brass

## Recommended for Singers

Mus 530 Song Literature 3
Mus 534 ChoralLiterature I 3
Mus 536 Opera Literature 3
Mus 585 Diction forSingers:Italian 2
Mus 586 Diction forSingers: German 2
Mus 587 Diction forSingers:French 2
Mus 590 Fundamentals of Acting for 3 Singers
Recommended for Jazz Musicians
Mus 524 Instrumental Jazz Arranging I 2
Mus 525 Instrumental Jazz Arranging II 2
Mus 526 Instrumental Jazz Arranging III 2
Mus 540 Jazz Literature 3
Mus 571 Advanced Jazz Improvis ation I 2
Mus 572 Advanced Jazz Improvis ation II 2

Mus 573 Advanced Jazz Improvisation III

## Total Credit Hours: 26

Up to an additional 6 credits of applied music and 3 credits of ensemble can be used towards elective credits for the certificate if the candidatetakes more than a year to complete.

## THE SCHOOL OF BUSINESS

## Office of the Dean

320 Karl Miller Center, 503-725-3721
www.pdx.edu/business/

## Cliff Allen, Dean

Pamela Tierney, As sociate Dean, Faculty \& Research Jacob Suher, Associate Dean, Underg raduate Programs Melis a Appleyard, Associate Dean, Graduate Programs

## Undergraduate Programs Office

220 Karl Miller Center, 503-725-3712

## Graduate Programs Office

215 Karl Miller Center, 503-725-8001

## Undergraduate Programs

B.A., B.S. with concentrations in Accounting, Advertising Management, Business Technology \& Analytics, Finance, Human Resource Management, Management, Marketing, Supply \& Logistics Management.
Business Minor, Business Minor in Social Innovation, Business Minor in RealEstate Property Management, Business Minor in Advertising (for graphic design majors), Advertising Minor (for communications majors), Property Management Minor.
Certificate in Blockchain, Certificate in International Business, Certificate in Food, Beverage \& Goods Leadership, Certificate in Entrepreneurship, Certificate in the Athletic \& Outdoor Industry, Certificate in Social Innovation and Social Entrepreneurship, Certificate in Real Estate Property Management, Post-baccalaureate Certificate in Accounting, Pre-baccalaureate Certificate in Consumer Retail.

## Graduate Programs

M.B.A.-Master of Business Administration, M.S.Master of Science in Applied DataSciencefor Bus iness, M.S.-Master of Finance, M.S.-Master of Science in Global Supply Chain Management, M.B.A. HealthcareThe Healthcare M.B.A., MRED -Master of RealEstate Development, MTAX --Master of Taxation.
Certificate in Athletic \& Outdoor Industry, Certificate in Business Intelligence \& Analytics, Certificate in Global Supply Chain Management, Certificate in HR Analytics, Certificate in Real Estate (administered by CUPA), Certificate in Social Innovation, Certificate in Taxation

## Accreditation Status

The School of Business and its programs are nationally accredited by AACSB - Association to Advance Collegiate Schools ofBusiness. The School's accounting programhas separate accreditation from the AACSB. Such
accreditation means that The School of Business is part of the community of leading business schools that are recognized for their commitment to continuous quality improvement in management education through engagement, innovation, and impact. As an AACSB accredited institution, The School of Business holds itself accountable for improving business practice through scholarly education and impactful intellectual contributions.

## Undergraduate programs

The undergraduate programin business administration adheres to the principle that in a free society the business enterprise must be responsibly and efficiently managed. The undergraduate degree programincludes both business and non-business courses. The mis sion of the undergraduate programis to provide students with a broad understanding of business and to equip them with the dynamic skills required to work successfully in a complex and changing global environment.

Specialemphas is options are available within the business adminis tration major and are designed to prepare students for positions in accounting, business technology \& analytics, advertising, finance, human resource management, management \& leadership, marketing, and supply chain management. Business minors include the general business minor, the business minor in social innovation, the property management minor, the business minor in advertising for graphic design majors, and the advertis ing minor for communications majors. Certificates in entrepreneurship, blockchain, food industry management, the athletic and outdoor industry, property management, international business, and social innovation \& social entrepreneurship are also av ailable. The School of Business offers study abroad opportunities at the undergraduate and graduate levels.
The School of Business offers online business concentrations in Accounting, Business Technology \& Analytics, Finance, Human Res ource Management, Management \& Leadership, Marketing, or Supply \& Logistics Management.

## Student Advising

Undergraduate academic and career advisors are located in the Karl Miller Center Suite 220. Students should plan to meet with their advisor at least twice a year to ensure that requirements are being met and to get assistance in their job search preparation.
The Schoolof Business Website, http://www.pdx.edu/sba, contains announcements concerning upcoming activities, scholarships, student org anizations, internships, and career opportunities,
policies, and other information vital to all business students.

## Atmos Program

As the largest and most diverse business school in Oregon, we believe diversity, cultural awareness, and the inclusion of all people is paramount for institutional impact and global change. We believe inclusion and excellence are not mutually exclusive. This belief motivates everything we do. The Atmos programs upports diverse and his torically underrepresented business students of color and is a promise of academic and community support to help create an avenuefor a brighter future.

## DEGREE MAPS AND LEARNING OUTCOMES

To view the degree maps and expected learning outcomes for the School of Business' undergraduate degrees, go to www.pdx.edu/academic-programs/a-z.

## ADMISSION REQUIREMENTS

Students may declare business administration as their major field of study at any time after admis sion to Portland State University. However, students must formally join The School of Business before they are allowed to enroll in almost all 200-, 300- or 400-level business administration courses or to graduate with a business adminis tration degree.

To join The School of Business, students must be formally admitted to Portland State University and fill out the School's opt-In formavailable
at www.pdx.edu/business/undergrad-degreerequirements\#optin.

## PREREQUISITE BUSINESS REQUIREMENTS

## Courses

BA 101
Introduction to Business and World Affairs
BA 211 Fundamentals of Financial 4 Accounting
BA 213 Decision Making with Accounting Information
Ec 201 Principles of Microeconomics
Ec 202 Principles of Macroeconomics
Stat 241 Application of Statistics for Business
or
Stat 243
Comm 220
Wr 121

Introduction to Probability and Statistics I
Public Speaking
College Writing
or

Freshman Inquiry
BA 101: (waived for post-baccalaureate students)

Students can submit the SBA opt-in formanytime during the term, it is available online at www.pdx.edu/business/undergrad-degreerequirements\#optin.

## Undergraduate Academic Standing Policy

A minimum Portland StateUniversity cumulative GPA of 2.50 and a minimum GPA of 2.50 in business adminis tration courses taken at Portland State University are required to remain in good standing as a business adminis tration student and for graduation with a degree in businessadministration. Details on the School of Business Academic Standing Policy can be found online at https://www.pdx.edu/business/undergrad-formspolicies.

## PSU Academic Dismissal

If a student who has been admitted to the School of Business is academically dis mis sed by the University, that student will automatically loseSchool of Business admitted status. If a student who has lost admitted status des ires to complete degree requirements for programs in the School of Business, that student must reapply. At the time of reapplication the student must meet the required 2.50 PSU and PSU School of Business GPA requirement.

## BUSINESS ADMINISTRATION B.A./B.S.

## Requirements for major

In addition to meeting the general University requirements, the student in business adminis tration must take at least 82 credits in business administration courses of which at least 41 must be taken at PSU. This total will include the businesscore ( 52 credit hours if taken at Portland State), at least one option area (20-36 credits, depending on option chosen), and enough business electives to meet the minimum of 82 credits in business. A minimum of 180 credits is required for graduation.

## Prerequisite policy

Prerequis ites are strictly enforced in the School of Business and exceptions are not made. Before enrolling in any business course, students should read the course description and must complete any prerequisites that are listed. If a student completes a course before completing the prerequisite and later completes the prerequisite, credit for the prerequisite will not count toward 82 credits required in business. The instructor and/or School's Administration have the authority to adminis tratively drop any student who has not completed the prerequisites. Students must successfully complete the prerequis ite course with a C -or better.

## Second Degree Students

Second degree(post-baccalaureate) students will need to meet the requirements for their major. In addition, postbaccalaureate students must request a review of their first degree to determine if they have met the Bachelor of Arts or Bachelor of Science requirements. This can be done by emailing theirbusiness advisor with the request for a first degree evaluation. Post-baccalaureate students should plan to meet with an advis or to determine if any of their previous coursework counts towards the business major requirements, to plan out their curriculum, and to discuss career resources.

## REQUIREMENTS

Business administration students must complete the following courses with a C - or better:

| Core courses |  |  |
| :--- | :--- | ---: |
| BA 101 |  |  |
|  | Introduction to Business and <br> World Affairs | 4 |
| BA 211 | Fundamentals of Financial <br> Accounting | 4 |
| BA 213 | Decision Making with | 4 |
|  | Accounting Information |  |
| BA 216 | Applied Excel for Business | 2 |
| BA 300 | Business and Professional <br> Communication | 2 |
| BA 301 | Research and Analysis of | 4 |
|  | Business Problems | 4 |
| BA 302 | OrganizationalBehavior | $0-4$ |
| BA 303 | Business Finance | 4 |
| BA 311 | Marketing Management | 4 |
| BA 325 | Information Literacy \& | 4 |
|  | Technical Competence for |  |
| BA 327 | Business Professionals |  |
| BA 339 | Data Analysis \& Visualization | 2 |
| BA 385 | Supply Chain Management | 4 |
| BA 495 | Business Environment | 4 |

## Business specialization options

(see descriptions below)
Subtotal: 20-38

## BUSINESS CONCENTRATIONS

The School of Business offers concentrations for those students seeking specialization in a subject area. Each student must selectoneof these concentrations and complete the required courses with a C - or better. Concentration requirements are satisfied by taking 20 to 36 upper-division credits bey ond the required business core. The courses specified to satisfy the concentration requirements are:

## Accounting

Objective: to enable students to acquire the necessary technical and professional skills for successful careers in public, management, orgovernmental accounting.

| Actg 335 | Accounting Information Systems <br> and Analytic Fundamentals | 4 |
| :--- | :--- | :--- |
| Actg 360 | Management Accounting <br> Actg 381 | Financial Accounting and <br> Reporting I |
| Actg 382 | Financial Accounting and <br> Reporting II | 4 |
| Actg 383 | Financial Accounting and | 4 |
|  | Reporting III | 4 |
| Actg 421 | Taxation | 4 |
| Act 430 | Governmental Accounting | 2 |
| Actg 492 | Auditing Concepts and Practices | 4 |
| Actg 495 | Integrated Accounting Is sues | 4 |

One upper-di vision accounting course to be chosen from:
Actg 422 Advanced Taxation 4
Actg 445 Forensic Accounting 4
Actg 460 Advanced Managerial 4
Accounting
Actg 485 Business Law 4
Actg 493 Advanced Auditing 4
Actg 407 Seminar 1-6
Subtotal: 36-38
Business Technology and Analytics
Objective: to providerequisite knowledge and skills which enable the student to meet the challenges of working within information-rich business en vironments.

Subtotal: 28

| Core |  |  |
| :--- | :--- | :--- |
| BTA 350 | Business ProblemSolving with | 4 |
| BTA 415 | Analytics and Visualization |  |
| Database Management | 4 |  |
| BTA 419 | Business Analytics with <br> BTA 420 | Programming <br> STA tems Analysis and Design |

Subtotal: 20

## Hectives

The 8 credits of electives can be either: within the Business Technology and Analytics area at the 400 levelor from an approved list of courses.

Approvedelectives:

| Actg 407 | Accounting Analytics | 4 |
| :--- | :--- | :--- |
| Actg 335 | Accounting Information Systems | 4 |
| BTA 483 | and Analytic Fundamentals |  |
| Blockchain in Business | 4 |  |


| Fin 419 |  <br> Modeling | 4 |
| :--- | :--- | :--- |
| GSCM 412 | Introduction to Enterprise <br> Resource Planning Systems <br> Gecision Making Using | 4 |
| GSCM 430 | Enterprise Systems and Data <br> Analytics | 4 |
| GSCM 450 | Project Management |  |
| GSCM 451 | Business Forecasting <br> Mgmt 442 | Human Resources Information <br> Systems \& People Analytics |
| Mktg 448 | Digital Media Planning and | 4 |
| Mktg 460 | Analytics <br> Marketing Research <br> Mktg 462 | Marketing Analytics |
| BTA 481 | Blockchain Fundamentals <br> And | 4 |
| BTA 482 | Blockchain Fundamentals Lab | 4 |

Subtotal: 8
Additional electives (including GSCM 410) as approved.

## Advertising Management

Objective: to provide the knowledge and skills necessary for students to create and execute advertising strategy within the broader context of the marketing function.

| Mktg 340U | Advertising | 4 |
| :--- | :--- | :--- |
| Mktg 363 | Consumer Behaviorand | 4 |
|  | CustomerSatisfaction |  |
| Mktg 441 | Media Strategy | 4 |
| Mktg 442 | Creative Strategy | 4 |
| Mktg 443 | Advertising Campaigns | 4 |
| Mktg 460 | Marketing Research | 4 |

Subtotal: 24
Note: Students who wish to complete a double concentration in advertising management and marketing cannot apply more than eight common MKTGelective credits to each concentration.

## Finance

Objective: to provide undergraduate students with the educational foundation and exposure to the broad field of finance, enabling themto develop their financialdecision making skills so that they can be successful as finance professionals in their chosen financial career path.

Subtotal: 28

## Core

| Actg 381 | Financial Accounting and <br> Reporting I | 4 |
| :--- | :--- | :--- |
| Fin 319 | Intermediate Financial | 4 |
|  | Management |  |
| Fin 352 | Investments | 4 |
| Fin 449 | Valuation | 4 |

Subtotal: 16

One upper-division finance course to be chosen from:

| Fin 410 | Selected Topics | $1-4$ |
| :--- | :--- | ---: |
| Fin 431 | Financial Markets \& Institutions | 4 |
| Fin 456 | International Financial | 4 |
|  | Management |  |
| Fin 439 | Real Estate Valuation I | 4 |

Subtotal: 4
Two upper-division finance cours es to be chosen from:

Fin $410 \quad$ Selected Topics 1-4
Fin $419 \quad$ Financial Data Analytics \& 4
Modeling
Fin $441 \quad$ Fundamentals of Derivative 4
Fin $457 \quad$ Real Estate Investment 4
Fin $465 \quad$ Finance Topics and Cases 4
Fin $473 \quad$ Investment Analysis and 4
Portfolio Management
Subtotal: 8

## Human Res ource Management

Objective: to provide a conceptual framework, as well as the necessary hands-on knowledge, skills, and abilities, that allow students to understand what is required, what is possible in terms of HRM techniques and the application of data and analytics to achieve and engage in more effectively manage human resources within an organization.

| Mgmt 351 | Human Resource Management | 4 |
| :--- | :--- | :--- |
| Mgmt 461 | Reward Systems and <br>  <br> Mgerformance Management | 4 |
| Mgmt 493 | Staffing and Employee Selection | 4 |
|  | Human Resource Strategy | 4 |
|  | Upper-division management <br> courses | 4 |
|  | Elective | 4 |

Subtotal: 24
Of the 8 credits of electives, four credits must be taken within the management area at the 400 level.

The final fourelective credits mustbe froman approved list of courses.

Note: Students who wish to complete a double concentration in management \& leadership and human resource managementcannot apply more than eight common credits to each concentration.

## Management and Leadership

Objective: to provide requisite knowledge and skills which enable the student to meet the challenges of leadership and managerial responsibilities.

| Mgmt 351 | Human Resource Management | 4 |
| :--- | :--- | :--- |
| Mgmt 428 | Team Processes | 4 |


| Mgmt 445 | Organizational Design and <br> Mgmt 464 <br>  <br> Change <br> Contemporary Leadership Issues | 4 |
| :--- | :--- | :--- |
|  | Upper-division management <br> courses <br> Elective | 4 |
|  |  | 4 |

Of the 8 credits of electives, four credits must be taken within the management area at the 400 level.

The final four credits can be either: within the management area at the 400 level or from an approved list of courses.
Note: Students who wish to complete a double concentration in management and leadership and human res ource management cannot apply more than eight common credits to each concentration.

## Marketing

Objective: To provide students with a strong academic foundation in marketing and to enable students to gain the strategic, technical, and professional skills necessary for career success.

| Mktg 363 | Consumer Behavior and <br> CustomerSatisfaction | 4 |
| :--- | :--- | ---: |
| Mktg 460 | Marketing Research | 4 |
| Mktg 464 | Marketing Strategy and <br> Management | 4 |
| Mktg 462 | Marketing Analytics <br> Mktg 448 | Digital Media Planning and <br> Analytics |
|  | Upper-division marketing <br> elective(s) | 4 |

Subtotal: 28
Students who wish to complete a double option in marketing and advertising management cannot apply more than 8 common Mktg elective credits to each option.

Marketing students can choose their electives fromany of the available upper-division (300- or 400-level) elective courses offered at the School of Business with the exception of MKTG404.

## Supply and Logistics Management

Objective: to provide students with an interdisciplinary foundation in supply chain management in preparation for careers in purchasing, industrial distribution, log istics, trans portation, and operations management.
GSCM 429 Global trans portation and 4
Logistics management
GSCM 439 Global Sourcing and Negotiation 4
GSCM 479 Global Supply Chain Strategy and Sustainability Management
Three of the following electives as approved by supply and logistics management faculty:
GSCM 410 Selected Studies

| GSCM 412 | Introduction to Enterprise | 4 |
| :---: | :---: | :---: |
|  | Resource Planning Systems |  |
| GSCM 432 | Craft Beverage Operations | 4 |
|  | Management |  |
| GSCM 440 | Governmental Procurement | 4 |
| GSCM 450 | Project Management | 4 |
| GSCM 451 | Business Forecasting | 4 |
| GSCM 454 | Supply and Logistics | 4 |
|  | Negotiations |  |
| GSCM 458 | Purchasing and Logistics within the Food Industry | 4 |
| GSCM 459 | Production Planning and Control | 4 |
| GSCM 469 | Lean Management | 4 |
| BTA 410 | Selected Topics | 1-6 |
| ISQA 430 | Industrial Transportation and Freight | 4 |
| ISQA 431 | Transportation Regulation Other electives as approved by Supply and Logistics faculty | 4 |

Subtotal: 24

## School of Business Honors Track

The School of Business Honors Program is a cohort of high performing, dedicated underg raduate business students who want to take core business courses and build lasting relationships with other honors students, build leadership skills, attend monthly professional development works hops that offer opportunities for networking, and give back to the community.

Honors students challenge thems elves and polish their professional and academic business skills through a combination of special honors sections of core business courses and enjoy special opportunities to interact with businessprofessionals, including CEOs and other business executives. Successful completion of all honors requirements results in an Honors designation on the student's diploma.
Requirements for honors track designation include:

- Exclusive access to Honors-only sections for BA 301, BA 311, BA 385, BA 495, and a 1-credit leadership course
- Monthly professional development workshops (during the academic year), including events featuring guest speakers, business executives, and business communication content
- 30 hours of community service
- Cumulative PSU and business major GPA $\geq 3.5$ upon completion of degree requirements

For admission to the honors track, students must be degree-seeking undergraduates who are admitted to the School of Business. Applications are evaluated based on GPA, application essays, and recommendation letters. Freshmen are encouraged to apply and will be conditionally admitted untilall application materials are submitted at the end of their sophomore year.
Honors programrequirements are subject to change. For the most current honors requirements, more detailed application information, and link to apply vis it: www.pdx.edu/sba/business-honors-track

## BUSINESS ADMINISTRATION MINOR

The School of Business offers a 28 credit minor to students majoring in other disciplines who wish to add a business background to their programof study. The minor emphasizes an applied approach to the basic functional areas of business, including accounting and finance, organizational management, marketing and advertising, and entrepreneurship. It is well-suited for the student majoring in the liberal arts and sciences, architecture, fine and performing arts, engineering, urban and public affairs, or pre-health sciences who intends to work as an independent contractor or operate a s mall firm or practice.

## REQUIREMENTS

Coursework requirements for the minor in business administration are as follows.

| Courses |  |
| :---: | :---: |
| BA 101 | Introduction to Business and |
|  | W orld Affairs |
| Fin 218 | PersonalFinance |
| BA 306U | Essentials of Finance for Non- |
|  | Business Majors |
| BA 316U | Es sentials of Marketing for NonBusiness Majors |
| BA 326U | Essentials of Management for |
|  | Non-Business Majors |
| BA 336U | Es sentials of Information |
|  | Technology for Non-Business |
|  | Majors |
| BA 346U | Essentials of Entrepreneurship |
|  | for Non-Business Majors |

Subtotal: 28
The PSU cumulative GPA and the PSU business GPA must be 2.00 for a student to graduate with the minor.

## BUSINESS MINOR IN SOCIAL INNOVATION

The Business Minor in Social Innovation is designed for non-business majors interested in social innovation, social entrepreneurship, and social intrapreneurship as a field of
study and career option. The minor teaches a mix of technical skills, such as marketing and finance, and 21stCentury or "changemaker" human skills, such as problem solving and social/emotional intelligence.

## REQUIREMENTS

| BA 101 | Introduction to Business and <br> World Affairs | 4 |
| :--- | :--- | :---: |
| BA 306U | Essentials of Finance for Non- <br> Business Majors | 4 |
| BA 316U | Essentials of Marketing for Non- <br> Business Majors | 4 |
| BA 326U | Essentials of Management for <br> Ngm-Business Majors | 4 |
| Mgmt 422 | Design Thinking for Social <br> Innovation <br> Money Matters for Social | 4 |
| Mgmt 423 | Innovation <br> Storytelling and Impact <br> Measurement for Social | 4 |
| Innovation |  |  |

Subtotal: 28

## BUSINESS MINOR IN REAL ESTATE PROPERTY MANAGEMENT

The Business Minor in RealEs tate Property Management is designed for non-business majors interested in real es tate property management as a field of study and career option. The minor brings together core business courses and courses specific to real estate property management, to teach a mix of technical skills (marketing/leasing, finance, building maintenance) and people management skills (critical thinking and problemsolving, human resource management, and customer service). Completion of the minor prepares students for careers as a real estate property manager, as set manager, as well as real estate lending, brokerage, and appraisal.

## REQUIREMENTS

| BA 101 | Introduction to Business and <br> World Affairs | 4 |
| :--- | :--- | :---: |
| BA 306U | Essentials of Finance for Non- <br> Business Majors <br> Essentials of Marketing for Non- | 4 |
| BA 316U | Business Majors |  |
| BA 326U | Essentials of Management for <br> Non-Business Majors | 4 |
| BA 332U |  | 4 |
| Mgmt 432 | Society <br> Multifamily Property <br> Management | 4 |

$\begin{array}{ll}\text { Mgmt } 433 & \begin{array}{l}\text { Commercial Property and Asset } \\ \text { Management }\end{array}\end{array}$
Total CreditHours: 28

## BUSINESS MINOR IN ADVERTISING FOR GRAPHIC DESIGN MAJORS

The Business Minor in Advertising for graphic design majors provides critical business, marketing and advertis ing skills to students who plan careers in the graphic designfield. The seven courses in the minor provide an applied approach to the basic functional areas of business planning, finance, organizational management, marketing and advertis ing, including marketing's role in business, consumer behavior, identify ing target markets, creative and media strategy development, and promotional campaign planning. All courses must be graded, the minimum passing grade for the Business Minor in Advertising courses is a C-.

## REQUIREMENTS

Interested students should contact an advisor in the School of Business Undergraduate Student Services and Advising Office to plan out the required courses. Courses in the minor include:

## Courses

| BA 101 | Introduction to Business and | 4 |
| :--- | :--- | :--- |
|  | World Affairs |  |
| BA 316U | Essentials of Marketing for Non- | 4 |
|  | Business Majors |  |
| Fin 218 | PersonalFinance | 4 |
| Mktg 340U | Advertising | 4 |
| Mktg 442 | Creative Strategy | 4 |
| Subtotal:24 |  |  |


| Four credits of one of the following electives: |  |  |
| :--- | :--- | :--- |
| Mktg 440 | Practicum: FIR NW Student Ad | 4 |
|  | Agency |  |
| Mktg 443 | Advertising Campaigns | 4 |
| Mktg 449 | Portfolio Workshop | 2 |

Total CreditHours: 24
ADVERTISING MINOR FOR COMMUNICATIONS MAJORS

## REQUIREMENTS

The Business Minor in Advertising for communication majors requires 24 credit hours. The objective of this minor is to familiarize communication majors with general business practices and the marketing communications industry specifically. The undergraduate minor's focus is interdisciplinary, including courses in the School of

Business and the communication department. Twenty of these hours will be taken within the School of Business and fourcredit hours can be a communication or business elective. All courses must be graded, the minimum pas sing grade for the Business Minor in Advertising courses is a C-

Five required courses:

| BA 316U | Essentials of Marketing for Non- <br> Business Majors | 4 |
| :--- | :--- | :--- |
| Mktg 340U | Advertising | 4 |
| Mktg 441 | Media Strategy | 4 |
| Mktg 442 | Creative Strategy | 4 |
| Mktg 443 | Advertising Campaigns | 4 |

Mktg 340U is a prerequisite for all other MKTGcourses and should be taken early.

Mktg 441 \& Mktg 442 are prerequis ites for Mktg 443.
Plus one communication or business elective from the following:

| Mktg 440 | Practicum: FIR NW Student Ad <br> Agency | 4 |
| :--- | :--- | :--- |
| Mktg 448 | Digital Media Planning and | 4 |
|  | Analytics |  |
| Mktg 449 | Portfolio Works hop | 2 |
| Comm 341 | Introductionto Public Relations | 4 |
| Comm 489 | Media Ethics | 4 |

Subtotal: 24

## Undergraduate Certificates

## POST-BACCALAUREATE ACCOUNTING CERTIFICATE

The Postbaccalaureate Accounting Certificate is a program for students who have earned one or more baccalaureate degrees and who wish to complete the coursework to prepare for a career in accounting. These recommendations include courses in accounting providing professional preparation for public or industry accounting. In addition, courses are recommended in law, basic business, and in other related areas for those whose underg raduate degree is not in business administration.

## PROGRAM PREREQUISITES

The following must be complete prior to beginning the upperdivision programrequirements:

1. Have earned a baccalaureate degree recognized by the PSU Office of Admissions, Registration and

## Records and be formally admitted as a postbaccalaureate student to PSU.

| 2. Have completed the following prerequisite courses |  |  |
| :--- | :--- | :--- |
| with a grade of C- or better: |  |  |
| BA 211 | Fundamentals of Financial <br> Accounting | 4 |
| BA 213 | Decision Making with | 4 |
| Stat 241 | Accounting Information <br> Application of Statistics for | 4 |
| Ec 201 | Business |  |
| Ec 202 | Principles of Microeconomics | 4 |

Subtotal: 20
Note: BA 101 prerequisite for BA 211 is waived for postbaccalaureate students; contact your advisor via emailfor a regis tration override to get into BA 211. Contact information for all Schoolof Business Career \& Academic Advisors is available online at www.pdx.edu/sba/career-academic-advising .

## REQUIREMENTS

## Core

| Actg 335 | Accounting InformationSystems <br> and Analytic Fundamentals | 4 |
| :--- | :--- | :--- |

Actg $360 \quad$ Management Accounting 2
Actg $381 \quad$ Financial Accounting and 4
Actg 382 Financial Accounting and 4
Reporting II
$\begin{array}{ll}\text { Actg } 383 & \begin{array}{l}\text { Financial Accounting and } \\ \\ \text { Reporting III }\end{array}\end{array}$
Actg $421 \quad$ Taxation 4
Actg 430 Governmental Accounting 2
Actg $492 \quad$ Auditing Concepts and Practices 4
Actg 495 Integrated Accounting Is sues 4
Additional credits chosen from: $(\mathbf{7 - 8}$ credits)
Actg $422 \quad$ Advanced Taxation
Actg $445 \quad$ Forensic Accounting 4
Actg $460 \quad$ Advanced Managerial 4
Accounting
Actg $485 \quad$ Business Law 4
Actg 490 Advanced Financial Accounting 2
Actg 493 Advanced Auditing 4
Actg 407 Seminar 1-6
Other required credits

| BA 303 | Business Finance | 4 |
| :--- | :--- | :--- |
| BA 325 | Information Literacy \& | 4 |
|  | Technical Competence for |  |
|  | Business Professionals |  |

It is recommended that PBACStudents take ACTG281 to coverdebits and credits.

## Total Credit Hours: 47-48

At least 30 credits required for the certificate and at least 27 of the credits in accounting mustbe taken in residence at Portland State University. Candidates must achieve at least a grade of C - in each course presented for the certificate. Entrance and exit GPA requirements are the same as for the School of Business undergraduate program. For retention in the program, grade point averages will be based only on coursework taken in the certificate program.
Post-baccalaureate students who do nothold a degree from a university where the language of instruction was English must satisfy the WR 323 requirement before completion of a certificate program. Students who received an accounting degree outside the United States may earn the postbaccalaureate accounting certificate. Students who received an accounting degree in the United States are not eligible to earn an accounting certificate.

## ATHLETIC \& OUTDOOR INDUSTRY UNDERGRADUATE CERTIFICATE

From concept to consumer, the Athletic and Outdoor Industry certificate programexplores the unique challenges and competitive is sues within the athletic and outdoor industry. It is forstudents who want to go beyond product design and sports management to examine the larger competitive industry is sues in marketing, retailing, distribution, and sales. This certificate offers pathways from different majors, offering a diversity of talent and perspectives.
This certificate can be added to majors with approved pathways. School of Business students must complete degree requirements specified for a Business Administration major to be awarded the Athletic \& Outdoor Industry Certificate. Non-business majors must complete BA 316U, MKTG436, MKTG437, MKTG375, and two courses from their major.

To be awarded the certificate, non-business students must complete all certificate requirements specified below. Please note that there are different requirements for different majors.

| Required Courses (16 credits): |  |  |
| :--- | :--- | :--- |
| BA 311 | Marketing Management <br> or | 4 |
| BA 316U | Essentials of Marketing for Non- <br> Business Majors | 4 |
| Mktg 375 | Retailing <br> Mktg 436 | Competitive Dynamics in the <br> Athletic and Outdoor Industry |
| Mktg 437 | Product Management in the <br> Athletic and Outdoor Industry | 4 |
|  | A |  |

Required Courses ( $\mathbf{1 6}$ credits):

4

## Select two courses from the college/major as listed below ( 8 credits):

School of Business

| Other courses may be substituted with the permission of the programdirector. |  |  |
| :---: | :---: | :---: |
| Mktg 338U | Professional Selling | 4 |
|  | or |  |
| Mktg 467 | Sales Management | 4 |
| GSCM 429 | Global transportation and | 4 |
|  | Logistics management |  |
|  | or |  |
| GSCM 439 | Global Sourcing and Negotiation | 4 |
| Communications Major |  |  |
| Comm | Media Literacy | 4 |
| 312 U |  |  |
| Comm | Persuasion | 4 |
| 314 U |  |  |
| Comm 445 | Risk and Strategic | 4 |
|  | Communication |  |
| Graphic Design Major |  |  |
| Des 321 | Brand Lab | 6 |
| Des 408 | Workshop | 2 |
| Psychology Major |  |  |
| Psy 361 | Industrial Psychology | 4 |
| Psy 362 | Organizational Ps ychology | 4 |
| Textile Arts |  |  |
| Art 313 | Textile Design | 4 |
|  | or |  |
| Art 316 | Fabric \& Form | 4 |
| Art 416 | Textile Arts Studio | 4 |
| Subtotal: 24 |  |  |

Total Credit Hours: 24

## BUSINESS BLOCKCHAIN UNDERGRADUATE

 CERTIFICATEThe objectiveof the Business Blockchain Certificate is to provide students with knowledge ofblockchain and cryptocurrency concepts and an understanding of how these technologies can transformbusinesses and industries. The program will equip students with the ability to 1) use analytical skills to address technical and businessproblems,2) work with distributed ledger technologies, and 3) respond effectively to blockchainrelated changes and opportunities in their companies and industries. Because all functional areas of business will be affected by blockchain technology, students fromany businessundergraduate concentration can strengthen their
businessknowledgeand skill by adding thecertificate to their degree programs.

| BTA 481 | Blockchain Fundamentals | 4 |
| :--- | :--- | ---: |
| BTA 482 | Blockchain Fundamentals Lab | 2 |
| BTA 483 | Blockchain in Business | 4 |
| BTA 484 | Blockchain in Business Lab | 2 |
| BTA 485 | Blockchain Uses and | 4 |
|  | Applications |  |
| BTA 486 | Emerging Topics in Blockchain | 2 |
| Total Credit Hours: 18 |  |  |
|  |  |  |
| CONSUMER RETAIL PRE-BACCALAUREATE |  |  |
| CERTIFICATE |  |  |

20-credit certificate programoffered to industry professionals in the food, beverage, and consumer packaged goods industry. The goal is to provide opportunities for professionals working in this industry to advance their education and career opportunities.

Apply for the certificate through the School of Business as a non-degree seeking student (including application fee and processing fee). Eligibility requirements include completion and receipt of the Western Association of Food Chains (WAFC) Retail Management Certificate (RMC); at least 5 years of professional industry experience; employer letter of support; and commitment to participate in a 1credit/fee orientation program.

## Hectives

| Select two courses fromthe following menu: |  |  |
| :--- | :--- | :--- |
| Mktg 338U | Profess sional Selling | 4 |
| Mktg 467 | Sales Management | 4 |
| Mgmt 461 | Reward Systems and | 4 |
|  | Performance Management |  |
| Mgmt 464 | Contemporary Leadership Is sues | 4 |
| Comm 220 | Public Speaking | 4 |
| Stat 241 | Application of Statistics for | 4 |
|  | Business |  |

Subtotal: 8

| Core <br> BA 316U | Essentials of Marketing for Non- <br> Business Majors | 4 |
| :---: | :--- | :---: |
| Mktg 363 | Consumer Behavior and <br> Customer Satisfaction | 4 |
| Mktg 435 | or <br> Consumer Package Goods <br> Marketing | 4 |


| GSCM 310 | Introduction to Supply Chain <br> Management of Food and <br> Beverage Systems |
| :--- | :--- | :--- |

Subtotal: 12
Total Credit Hours: 20
Minimum grade requirement: C-
P/NP allowed: Yes

## ENTREPRENEURSHIP CERTIFICATE

Learn the fundamentals of entrepreneurship by identifying market needs, conceptualizing approaches to fulfill those needs, researching potential avenues, assessing enduring bus iness models, structuring the venture, raising funding for launch and sustained growth.
Students are required to complete the degree requirements specified for a business adminis tration major in order to be awarded the Entrepreneurship Certificate. In addition, students must complete all certificate requirements specified below:

## CERTIFICATE REQUIREMENTS

## Requirements List

| Fin 310U | Entrepreneurial Finance and | 4 |
| :--- | :--- | :--- |
|  | Accounting |  |
| Mktg 338U | Professional Selling | 4 |
| Mgmt 481 | Entrepreneurship | 4 |
|  | Emphasis Area Course | 4 |

Subtotal: 16
Emphas is Area (choose 1 additional course frombelow; all prerequisites must be met).

## Small/Family Business

- Mgmt 409 - Practicum: Small Business Consulting (Business Outreach Program) (4 credit hours)
- Mgmt 404, Mktg 404, Fin 404 - Internship

Internship options include, but are not limited to:

- Internship with the Portland State Business Accelerator
- Internship with a BA 495 Capstone Client (4 credit hours)


## Innovation

- Mgmt 410- Developing Creativity and Innovation in Business (4 credit hours)

Alternatively, students can select the one additional course from other certificate programs:

- Athletic \& Outdoor Industry, Social Innovation, or Food Industry Leadership

Therefore, there will be a total of four courses completed for the certificate: three core and then one chosen by the student to tailor the experience to his/her interest.
Alternatively, students can select the 1 additional course from external certificate programs in Athletic \& Outdoor, Social Innovation, the Business of Craft Brewing, or the Food Industry Management Certificate.

Alternatively, students can select the 1 additional course from external certificate programs in Athletic \& Outdoor, Social Innovation, the Business of Craft Brewing, or the Food Industry Management Certificate.

## FOOD, BEVERAGE \& GOODS LEADERSHIP CERTIFICATE

The Food, Beverage \& Goods Leadership Certificate provides undergraduate students with an educational foundation in the field of retail food, beverage and cons umer packaged goods distribution, marketing, and management. Certificate requirements include the study of the overall competitive business marketplace of the retail industry froma cross-industry perspective, consumer trends, trade relationships, supply and logistics issues, retailing and distribution, purchasing and merch andis ing. Certificate courses include strong industry participation from guest speakers to current case studies.
This certificate can also be added to majors with approved pathways. School of Business students must complete degree requirements specified for a Business Adminis tration major to be awarded the Food, Beverage \& Goods LeadershipCertificate. Non-business majors must complete BA 316U, BA 339, MKTG 375, MKTG435, and two courses from their major.

To be awarded the certificate, students must complete all certificate requirements specified below. Please note that there are different requirements for different majors.

| Required Courses |  |  |
| :--- | :--- | :--- |
| BA 311 | Marketing Management <br> or | 4 |
| BA 316U | Essentials of Marketing for Non- <br> Business Majors | 4 |
| BA 339 | Supply Chain Management | 4 |


| GSCM 429 | or <br> Global transportation and <br> Logistics management <br> or | 4 |
| :--- | :--- | ---: |
| GSCM 439 | Global Sourcing and Negotiation | 4 |
| Mktg 375 | Retailing | 4 |
| Mktg 435 | Consumer Package Goods <br> Marketing | 4 |

## Select two courses from the college/major as listed

 below ( 8 credits):
## School of Business

Other courses may be substituted with the permission of the programdirector.

| Actg 460 | Advanced Managerial | 4 |
| :--- | :--- | :--- |
| Accounting |  |  |

BTA 481 Blockchain Fundamentals 4
Mgmt 351 Human Resource Management 4
Mgmt 461 Reward Systems and 4
Performance Management
Mgmt 464 Contemporary Leadership Issues 4
Mktg 338U Professional Selling 4
Mktg 467 Sales Management 4
$\begin{array}{ll}\text { Communications Major } \\ \text { Comm } & \text { Media Literacy }\end{array}$
312U
Comm Persuasion 4
314 U
Comm 445 Risk and Strategic
Graphic Design Major
Des 321 Brand Lab
Des 408 Workshop 2
Psychology Major

| Psy 361 | IndustrialPsychology | 4 |
| :--- | :--- | :--- |
| Psy 362 | Organizational Ps ychology | 4 |

## INTERNATIONAL BUSINESS CERTIFICATE

The International Business Certificate provides undergraduate students with an educational foundation in the field of international business. Certificate requirements include the study of cultural, economic, social, and political as pects affecting business operations.
Students are required to complete degree requirements specified for a business adminis tration option in order to be awarded the International Business Certificate. In addition, students must complete all certificate requirements as specified below.

## REQUIREMENTS

The international business certificate allows students to choose one of two options:

1. Study Abroad Option - Study abroad and take 24 credits of pre-approved internationally related courses.
2. Campus Option - Take 36 credits at PSU of preapproved internationally relatedcourses.

Abroad Option $=\mathbf{2 4}$ credits + Study Abroad
International business requirements (12 credits)
Selected any 12 credits from:

- Fin 456 International Financial Management
- Mktg 376 International Business
- Mgmt 446 International Management
- Mktg 466 Principles of International Marketing
- or other courses approved by advis or.


## Language, Area Studies, or International Economics ( 12 credits)

Select any 12 credits of language, economics, or global pers pectives cluster courses

- Language - Any world language offered at PSU
- Area Studies - Selected fromthe globalperspectives cluster list or other courses with advis or approval. The area study courses will be upper division and must contribute to the s tudent's understanding of the area of the world language being studied.
- Economics courses selected from: Ec 340, Ec 440, Ec 441, Ec 442, Ec 443, Ec 445, Ec 446 , Ec 447, Ec 448, Ec 450 or with approval, other upper division economic courses related to international studies.


## Study Abroad or International Internship Experience (No Credit Minimum)

- This requirement can be fulfilled with any PSUsanctioned study abroad or international internship. Internship must be completed via the online School of Business internship course.


## Campus Option $=\mathbf{3 6}$ credits

## Language ( 12 credits)

- Any world language offered at PSU - 12 credits of the same language - any level.


## AreaStudies or International Economics (12 credits)

- Area Studies - Selected fromthe global perspectives cluster list or other courses with advisor approval. The area study courses will be upper division and must contribute to the student's understanding of the area of the world language being studied.
- Economics courses selected from: Ec 340, Ec 440, Ec 441, Ec 442, Еc 443, Ec 445, Ec 446, Ec 447, Ec 448, Ec 450 , or with approval, other upper division economic courses related to international studies.


## International Business ( $\mathbf{1 2}$ credits)

## Selected from:

- Fin 456 International Financial Management
- Mktg 376 International Business
- Mktg 446 International Management
- Mktg 466 Principles of International Marketing
- or other courses approved by advis or or program director.


## REAL ESTATE PROPERTY MANAGEMENT CERTIFICATE

The Certificate in Real Estate Property Management is open to undergraduate business school students and provides students with foundational, industry-specific knowledge in real es tate property management. The Certificate introduces students to the fields of both multifamily (apartment) and commercial (office, retail, industrial, etc.) property management and prepares students forentry-level employment in operations and leasing as a property manager, as set manager, and corporate realestate professional as well as other jobs within the commercial real estate sector such as lending, brokerage, and appraisal, to name just a few.
Students are required to complete degree requirements specified for a business adminis tration major in order to be awarded the Real Estate Property ManagementCertificate.

| Core Real Estate Management Courses |  |  |
| :--- | :--- | :---: |
| BA 332U |  | 4 |
| Mgmt 432 | Society <br> Multifamily Property | 4 |
| Mgmt 433 | Management <br> Commercial Property and Asset <br> Management | 4 |


| Hectives | Subtotal: 12 |
| :--- | :--- |

Subtotal: 7-8
Choose a minimum of 4 elective credits from these
courses:

| USP 312U | Urban Housing and Development | 4 |
| :--- | :--- | ---: |
| USP 323U | Real Estate Development and | 4 |
|  | Finance |  |
| Actg 404 | Internship | $1-6$ |
| Fin 404 | Internship | $1-6$ |
| Fin 457 | Real Estate Investment | 4 |
| GSCM 404 | Cooperative | $1-6$ |
|  | Education/Internship |  |
| Mgmt 404 | Internship | $1-6$ |

Mktg 404 Internship 1-6

Choose 4 elective credits (if needed):

| Fin 439 | Real Estate Valuation I | 4 |
| :--- | :--- | :--- |
| Mgmt 351 | Human Resource Management | 4 |
| Mgmt 461 | Reward Systems and | 4 |
|  | Performance Management |  |
| Mgmt 464 | Contemporary Leadership Is sues | 4 |

Mktg 338U Professional Selling 4
Mktg 464 Marketing Strategy and 4
Total Credit Hours: 19-20

## SOCIAL INNOVATION AND SOCIAL ENTREPRENEURSHIP UNDERGRADUATE CERTIFICATE

The Social Innovation and Social Entrepreneurship Certificate programis open to undergraduate and graduate students and equips students with the latesttools and approaches to tackle the world's biggest challenges. Together, the four courses in this majority-online program will enable students to deeply examine a social or environmental problemof their choice and design a new business, nonprofit organization, or internal programto address that problem.
Throughout the program, students will be mentored by experienced PSU faculty, learn frompracticing social entrepreneurs, work with peer mentors, and interact with leading experts. Courses can be taken in any sequence, with permission. With a focus on leadership and purpose,

Impact Entrepreneurs guides students through a transformational learning experience.

## CERTIFICATE REQUIREM ENTS

| Undergraduate Certificate Requirements |  |  |
| :---: | :--- | :---: |
| Mgmt 421 | Design Thinking for Social <br> Innovation <br> or | 4 |
| ETM 356U | Introduction to Human-Centered <br> Design | 4 |
| Mgmt 422 | Money Matters for Social <br> Innovation | 4 |
| Mgmt 423 | Storytelling and Impact <br> Measurement for Social <br> Innovation | 4 |
| Mgmt 409 | Social Innovation Practicum <br> or <br> Mgmt 310 <br> Entrepreneurship for Sustainable | 4 |
| SySc 342U | Development <br> or <br> Systems Thinking for Social <br> Change | 4 |

Subtotal: 16

## Graduate programs

The School of Business offers seven programs leading to master's degrees. The Schoolalso participates in the SystemScience DoctoralProgram.

## ADMISSIONS AND APPLICATION REQUIREMENTS

Application requirements vary by program. See the website for application criteria.

The entire application process can take up to 8 weeks for domestic students and 12 week for international students (due to foreign transcript evaluation), so it is best to apply early, taking care to ensure every thing is completed properly. An admis sions coordinator will contact you with a confirmation once your application is received at the Graduate Business Programs Office.

## Fall Admission

Application and all supporting documents are due by May 1 for the following graduate business programs:

- The Portland MBA
- The Healthcare MBA
- Joint JD/MBA
- Master of RealEstate Development
- MS in Finance
- MS in Global Supply Chain Management
- MS in Applied Data Science for Business

Application and all supporting documents are due by
September 1 for the following graduate certificates:

- Athletic \& Outdoor Industry
- Business Blockchain
- Business Intelligence and Analytics
- Global Supply Chain Management
- HR Analytics
- SocialInnovation
- Taxation
- Real Estate Investment and Finance


## Winter Admission

Application and all supporting documents are due by December 1 for the following graduate certificates:

- Athletic \& Outdoor Industry
- Business Intelligence and Analytics
- HR Analytics
- Social Innovation
- Real Estate Investment and Finance


## Spring Admission

Application and all supporting documents are due by March 1 for the following graduate business programs and certificates:

- Athletic \& Outdoor Industry
- Business Blockchain
- HR Analytics
- Master of RealEstate Development
- MS in Global Supply Chain Management
- Social Innovation
- Real Estate Investment and Finance


## Summer Admission

Application and all supporting documents are dueby June $\mathbf{1}$ for the following graduatebusiness programs and certificates:

- Master of Taxation
- Athletic \& Outdoor Industry
- Social Innovation
- Taxation
- Real Estate Investment and Finance


## DEGREE PREREQUISITE REQUIREMENTS

## Master of Finance (MSF)

All applicants need to complete the following introductory coursework prior to admis sion: Financial Accounting, Managerial Accounting and Statistics. Applicants are also expected to be proficient in computer applications and spreadsheetskills.
See website for details.

## Master of Taxation (MT)

In addition to meeting the requirements for PSU and the School of Bus iness, programapplicants should meet one of the following four criteria:

- Be a current undergraduate accounting major with a 3.0 or higher GPA in upper division accounting courses and completing their degree matriculation into the MT
- Hold a bachelor's degree in accounting
- Hold a bachelor's degree outside of accounting with a 3.0 or higher GPA in a specified setof upper division accounting courses or
- Hold a J.D. degree.

See website for details.

## MASTER OF BUSINESS ADMINISTRATION (MBA)

The MBA is an integrated graduate programfocused on leadership, innovation and sustainability. Students mas ter essential technical skills through the Value Chain of Business courses and gain in-depth understanding of the global context of business in the Foundations of Competitiveness courses. In addition, students take a series of Applied Skills and Leadership courses that are integrated based on a set of managerial competencies, skills and pers pectives. A highlight of the MBA programis the International Experience, which requires that all MBA students participate in either a 10-14 day study abroad programora Portland Metro-based international business experience during their MBA experience.

The MBA is designed to accommodate students with business and non-business undergraduate degrees and is best suited for those who have gained at least two years of industry experience prior to their admis sion date.

Students may elect to complete the MBA programin either the full-time or part-time evening format. Students are
expected to progress through the program with their as signed cohort and follow the schedule of core courses. Both full-time and part-time students may complete optional certificates or other elective courses which are primarily offered during the evenings or online.
The goal of the MBA programis to develop highly effective managers and leaders. Students develop expertise in the technical areas of business, managerial competencies, and the ability to integrate technical expertise with managerial competencies to become effective leaders in organizations. This programseeks to produce future business leaders with an innovative spirit and a commitment to social, economic and environmental stewardship. The core coursework in the MBA programis grouped into three segments for a total of 62 credits: Foundations of Competitiveness, The Value Chain of Business, Applied Skills and Leadership, along with an International Experience.

## FOUNDATIONS OF COM PETITIVENESS (16 CREDITS)

These courses provide the student with a deepened understanding of the global and competitive challenges facing businesses today.

## Courses

Mktg 513 Pioneering Innovation 4

Fin $515 \quad$ Economics and Sustainability of 2
Fin $516 \quad$ Managerial Macroeconomics 2
BTA $519 \quad 4$
Mgmt $511 \quad$ Foundations of Strategy 2
Mgmt $514 \quad$ Integrated Strategy 2

## THE VALUE CHAIN OF BUSINESS (24 CREDITS)

The value chain segment builds an integrated foundation of coursework and provides in-depth knowledge in applied skills related to accounting, finance, management, marketing, and operations.
Courses
Actg $511 \quad$ Financial Reporting 4
Actg 513 Managerial Accounting and 4 Control
Mktg $512 \quad$ Marketing Strategy 4
Mgmt 512 Organizational Management 4
Fin 513 Financial Management 4
ISQA 511 Sustainable Operations 4
Management

## APPLIED SKILLS \& LEADERSHIP (22 CREDITS)

In the MBA program, student's leadership skills are as sessed and developed through integrated leadership courses, continuous attention to managerial competencies,
skills and pers pectives, and one-on-one leadership coaching. Students apply the technical business skills and leadership competencies gained through theMBA program in an intensive immersion experience midway through the program, and in a team-based consulting project with a regionalorganization.

| Courses <br> BA 521 | Leadership Assessment and <br> Development <br> Communications for Leaders <br> BA 522 | 2 |
| :--- | :--- | :--- |
| BA 523 | Executive Perspectives on | 1 |
| BA 524 | Leadership <br> BA 525 <br> Capstone Consulting Project | 1 |
| BA 526 | MBA International Experience | 4 |
|  | or | 4 |
| BA 527 | MBA Domestic Business | 4 |
|  | Experience | 4 |
| BA 528 | MBA Culture Module |  |
| BA 529 | Building Effective Teams | 1 |
| BA 530 | Thought Leadership | 1 |
| Fin 517 | Corporate Governance |  |
| Mgmt 516 | Project Management | 1 |
| Mgmt 517 | Negotiations for Managers | 2 |

CERTIFICATES: OPTIONAL
See the MBA websiteforcertificate options.

## WAIVER POLICY

Students may be eligible for waiver of some required courses in the MBA program. A waiver is based upon the student holding an undergraduate degree (earned within the previous seven years) or an active license in the specific discipline for which the waiver is sought. Specifically, the following courses may be considered for waiver: Actg 511, Actg 513, Fin 515, Fin 516, Fin 517, ISQA 511 and Mgmt 512. A student can waive a maximum of 13 credit hours from the courses aboveonly, thus reducing the required number of hours in the degree program. Students must apply for waivers during the summer prior to entering the program.

## FINANCE OPTION

The Finance option offered in conjunction with theMBA creates an opportunity to develop a concentrated skill set within the finance area. This option provides students the skills to understand complexfinancial is sues as well as experience in the application of financial tools that facilitate problemsolving. Students mustchooseelectives from the approved Finance option elective list.

## IMMERSIVE EXPERIENCE

A highlight of our programis the Immersive Experience (IE) required for all MBA students. The primary goal of the IE is to provide a first-hand experience of the opportunities and challenges of competing in a global marketplace. The IE is also designed to enhance cultural knowledge and enhance students' global mindsets in order to gain a global perspective. The IErequires either a 10- to 14-day immersion in a foreign country (BA 526) or a locally-based domestic business experience (BA 527) which may be available to students who petition for an approved exception to the international travel requirement. Students must complete at least their first year of the MBA core curriculumbefore participating in the IEor the domestic business experience.

## Shared Master's Credits

Admitted students in good standing may apply to use shared master's credits between the MBA and the MSF, MSGSCM, and select other Graduate Programs. For details contact the Academic Advising Team.

## APPLIED DATA SCIENCE FOR BUSINESS (M.S.)

The online Master of Science in Applied DataScience for Bus iness (MSADSB) focuses on the needs of business leaders to understand digital transformation and the importance of data science across functional areas. In addition to the core curriculum, students must complete at least 1 approved certificate plus additional credits fromany of the other approved certificates or electives to complete a minimum of 45 credits. The core curriculumimparts the businessfundamentals of accounting and strategy; the critical bus iness implications of digital transformation and the organizational change that it will neces sitate; the regulatory, ethical, and cybersecurity imperatives governing digital transformation; and an introduction to technical skills.

## Core

22 core credits, or 24 core credits if a data visualization course is notoffered in chosencertificate.
Mgmt 518 Digital Transformation of Business
Mgmt 519 Digital Trans formation:Security, Privacy \& Ethics
Mgmt 520 Leading Organizational Change During Digital Transformation
BTA 522 Special Topics in Data Science, Technology for Business
BTA 523 Special Topics in Data Science, Machine Learning Applications for Managers

| GSCM 512 | Global Managerial and Cost | 4 |
| :--- | :--- | :--- |
| GSCM 520 | Accounting | Global Supply Chain Strategy |

BTA 521 Data Visualization is required in core if no data visualization course in chosen certificate.
Actg 511 could substitute for GSCM 512.
Mgmt 511 could substitute for GSCM 520.

## Certificate

If BTA 521 Data Visualization is not taken in the core, then a minimum of 23 credits must be taken fromat least 1 approved certificate, with the balance of credits take $n$ from any of the other certificates or elective courses approved by the Academic Director.
If BTA 521 Data Visualization is taken in the core, then a minimum of 21 credits must be taken fromat least 1 approved certificate, with the balance of credits taken from any of the other certificates or electivecourses approved by the Academic Director.

The following graduatecertificates approved for the Master's programare:

- Human Resources Analytics (p. 133)(18 credits)
- Business Intelligence \& Analytics (p. 133) (21 Credits)
- Business Blockchain (p. 132) (18 credits)
- OHSU Health and Clinical Informatics Certificate (24 credits)
Total Credit Hours: 45
HEALTHCARE MBA
The Healthcare MBA is a joint degree programoffered by Portland State University's School of Bus iness and the Oregon Health \& Science University’s School of Medicine. The Healthcare MBA is offered in a part-time, two-year format. Courses are online with two required residencies per year. Students in this programlearn the knowledge, skills, and tools to function as effective managers and leaders in healthcare organizations. Specifically, graduates will be able to:
- Analyze the complexhealthcare systemacross critical domains and scales.
- Apply analytic frameworks to complexand ambiguous environments to create evidence-informed recommendations.
- Use awareness of self and others to lead and manage in complex organizations.
- Communicate with clarity and brevity, as appropriate to the audience and content.

The curriculumconsists of 63 credits of courses and is arranged in thematic categories: HealthcareSystem, Leadership, Operations and Quality, Business and Financial Planning, and Application Projects and Capstone. Courses balance theory and knowledge with practical application. Healthcare is thoroughly integrated throughout thecurriculum; however, where appropriate, attention will be called to best practices in other industries that could be beneficial in healthcare. The student cohort is composed of professionals in roles across the healthcare spectrum, including those serving in direct patient care capacities as well as those in administration; students represent large and small healthcare systems, clinics, government, biotech industry, pharmaceuticals, research, medical device companies, and many more.
Curriculum offered through OHSU:

| Cours $\mathrm{e}$ | Title | Credit s |
| :---: | :---: | :---: |
| $\begin{aligned} & \text { MGT } \\ & 520 \end{aligned}$ | Organizational Mindsets for Managers | 5 |
| $\begin{aligned} & \text { MGT } \\ & 530 \end{aligned}$ | Business Strategy in Healthcare | 4 |
| $\begin{aligned} & \text { MGT } \\ & 532 \end{aligned}$ | Design \& Innovation | 5 |
| $\begin{aligned} & \text { MGT } \\ & 549 \end{aligned}$ | Business Intelligence | 4 |
| $\begin{aligned} & \text { MGT } \\ & 554 \end{aligned}$ | Capstone | 5 |
| $\begin{aligned} & \text { MGT } \\ & 560 \end{aligned}$ | Healthcare Systems | 5 |
| $\begin{aligned} & \text { MGT } \\ & 561 \end{aligned}$ | FinancialReporting | 4 |
| $\begin{aligned} & \text { MGT } \\ & 562 \end{aligned}$ | Portfolio Management | 4 |
| $\begin{aligned} & \text { MGT } \\ & 565 \end{aligned}$ | Leadership Skills for Healthcare | 4 |
| $\begin{aligned} & \text { MGT } \\ & 569 \end{aligned}$ | Marketing and Strategic Communication | 5 |
| $\begin{aligned} & \text { MGT } \\ & 570 \end{aligned}$ | Operations \& Quality Management in Healthcare | 5 |
| $\begin{aligned} & \text { MGT } \\ & 572 \end{aligned}$ | Financial Management | 4 |
| $\begin{aligned} & \text { MGT } \\ & 575 \end{aligned}$ | Healthcare Economics | 4 |
| $\begin{aligned} & \text { MGT } \\ & 576 \end{aligned}$ | Executive Decision Making | 5 |

otalCredits:

## FINANCE M.S. (MSF)

The Master of Science in Finance (MSF) is an accelerated programthat provides students the skills and knowledge required to start or adv ance a career in finance. Focus areas include Corporate Finance, Traditional and Impact Investing. Thecurriculum is designed to develop forwardthinking professionals with sharp analytic minds, effective communication skills, and the necessary vision to apply financial analysis skills in a wide variety of business situations. Business and non-business students will benefit from the depth and integration of the curriculum.

Students may take courses on a full-time or part-time schedule. Full-time students can complete the programin one year and part-time students can complete it in two years. Mostclasses are in the evening.

## CORE

| Actg 550 | Advanced Financial Reporting | 4 |
| :--- | :--- | :--- |
| Actg 553 | Financial Statement Analysis | 4 |
| BA 522 | Communications for Leaders | 1 |
| BTA 519 | Managerial Analytics | 2 |
| Fin 531 | Financial Institutions | 2 |
| Fin 551 | Managerial Finance | 4 |
| Fin 552 | Investments | 4 |
| Fin 553 | Valuation Modeling | 2 |
| Fin 565 | Applied FinancialDecisions | 2 |
| Fin 578 | Emerging Topics:FinTech | 2 |
| Mgmt 511 | Foundations of Strategy | 2 |

M.S. in Finance students must take the 2-credit offerings of the BTA 519, Fin 553, Fin 565, and Fin 578 courses. Subtotal: 29

## ELECTIVES

Choose one Option of the three available to earn 16 elective credits. Other courses can qualify as electivecredit if pre-approved by the Academic Director.

## Option 1

Choose 16 credits total fromthis list of approved electives or from the Graduate Certificate in Business Blockchain or the Graduate Certificate in RealEstate Investment in Finance. Subject to prerequisite completion.
Fin 504
Co-Op/Internship 2
Fin 555 Quantitative Finance Methods 4
Fin 573 Investment Analysis and 4

Fin 579
Case Competitions
Machine Learning in Business
Mgmt 533 Alliances and Acquisitions 4
Portfolio Management:Issues and Performance Assessment Impact Ventures
Fin 575
Fin $577 \quad$ Derivatives and Financial Market $\quad 2$ Securities 2

Option 2
Complete the Graduate Certificate in Business Blockchain (p. 132). If you choose this option, you must apply forthe Graduate Certificate in Business Blockchain at least three terms before completing y our MSF program. Apply at apply.pdx.edu (subject to prerequisite completion). To make the application more streamlined, be sure to select "yes" under the prompt asking if you are already admitted to a graduate business program. You must also apply to graduate fromboth the GraduateCertificate in Business Blockchain certificate and the MSF program.

Substitute core required BTA 519 for BTA 586

## Option 3

Complete the Graduate Certificate in Real Estate Investment and Finance (p. 132). If you choose this option, you must apply for the Graduate Certificate in Real Estate Investment and Financeat leas three terms before completing your MSF program. Apply at apply.pdx.edu (subject to prerequisite completion). To make the application more streamlined, be sure to select "yes" under the prompt asking if you are already admitted to a graduate businessprogram. You must also apply to graduate from both the Graduate Certificate in Real Estate Investment and Finance and the MSF program.
Actg 550 shared with MSF core Subtotal: 16

## Total Credit Hours: 45

## GLOBAL SUPPLY CHAIN MANAGEMENT M.S. (MS GSCM)

The MS GSCM is a 45 -credit-hourprogramthat can be completed in six terms on a part time basis. This is an online degree that will start with a residency weekend orientation program. The programobjectives are to prepare students to design and manage an effective and efficient global supply chain; understand and apply supply chain analytics; conduct demand forecasting, aggregate planning, and sales and operations planning for a supply chain; understand the implications of supply chain initiatives in terms of key financial performance metrics; utilize sustainability-based initiatives and/or circular economy model, including closed-loop processes, to lessen the social and environmental impact of supply chains; assess
fundamental dimens ions of supply chain strategy, social and environmental res ponsibility, innovation, transformation and organizational leadership.
The end goal of the MS GSCM is to prepare globalleaders in developing strategies that support markets and innovation in a sustainable and efficient manner.

## REQUIREMENTS

| Required Courses (29 credits) |  |  |
| :---: | :---: | :---: |
| GSCM 507 | Global Supply Chain Digital | 1 |
|  | Technology Seminar |  |
| GSCM 511 | Principles of Strategic Global | 4 |
|  | Sourcing |  |
| GSCM 513 | Principles of Strategic Global | 4 |
|  | Logistics |  |
| GSCM 514 | Reverse Logistics and Closed | 4 |
|  | Loop Supply Chain |  |
| GSCM 517 | Supply Chain International Field | 4 |
|  | Study |  |
| GSCM 520 | Global Supply Chain Strategy | 2 |
| GSCM 522 | Global Leadership and Ethics in | 2 |
|  | Supply Chain Management |  |
| GSCM 525 | Supply Chain Caps tone | 4 |
|  | Consulting Experience |  |
| GSCM 573 | New Product Introduction and | 4 |
| Eectives (16 credits) |  |  |
| Choose 16 credits fromthe following electives: |  |  |
| BTA 516 | Multiple Regression with | 3 |
|  | Business Applications |  |
| BTA 520 | Introduction to Business | 4 |
|  | Intelligence and Analytics |  |
| BTA 522 | Special Topics in Data Science, Technology for Business | 2 |
| BTA 523 | Special Topics in Data Science, Machine Learning Applications for Managers | 2 |
| BTA | Blockchain Fundamentals | 4 |
| 581/BTA |  |  |
| 581S |  |  |
| BTA | Blockchain in Business | 4 |
| 583/BTA |  |  |
| 583S |  |  |
| GSCM 510 | SpecialTopics | 1-8 |
| GSCM 512 | Global Managerial and Cost | 4 |
|  | Accounting |  |
| GSCM 515 | Global Case Studies in Supply | 4 |
|  | Chain Management |  |
| GSCM 519 | Global Supply Chain | 4 |
|  | Negotiations |  |
| GSCM 560 | Supply Chain Modeling \& | 4 |
|  | Simulation |  |
| GSCM 571 | Business Analytics I | 4 |
| GSCM 572 | Business Analytics II | 4 |

## Shared Master's Credits

Admitted students in good standing may apply to use shared master's credits between the MS GSCM and MBA degrees. For details contact the Academic Advising Team.
Total Credit Hours: 45

## REAL ESTATE DEVELOPMENT MASTER (MRED)

The Master of RealEstate Development (MRED) is a professional degree, training students in the areas of real estate development within the context provided by principles of sustainability, social equity, and communitybased development. By its nature, real estate education is multi-disciplinary, involving finance, urban planning, architecture, law, engineering, design, apprais al, and other disciplines. To deliver this education, the MRED degree is a joint degree of the School of Business Adminis tration and the Toulan School of Urban Studies and Planning.
The objective for this programis to provide a unique and exceptional graduate degreethat will enable students to assist in the development, management and financing of property with an understanding of the role that such development plays in the context of broader community concerns and history, and in the context of the surrounding neighborhood and city. Students will work closely with high-level industry professionals in their classes and workshops.
The MRED degree is designed to accommodate students with a wide variety of undergraduate degrees and is best suited forstudents who have gained at least two years of industry experience prior to their admis sion date. The MRED programis designed to be completed in 12 months on a full-time basis or 24 months on a part-time basis. Fulltime students are admitted for fall term only. Students will develop their skills in three areas:sustainable and equitable urban development, finance and policy, and project development, leading to the Real Estate Development Workshop culminating experience.

## REQUIREMENTS

Students will develop their skills in three areas: sustainable urban development; realestate finance, markets and law; and project development, leading to the Real Estate Development Workshop culminating experience.

| Sustainable Urban Development |  |  |
| :--- | :--- | :--- |
| USP 527 | Commercial District |  |
|  | Revitalization | 3 |
| USP 569 | Sustainable Cities and Regions |  |
| USP 612 | Community, Planning, and |  |
| Ethics |  |  |
| Finance, Markets, and Law |  |  |
| RE 521 | Real Estate Finance I | 4 |
| RE 522 | Real Estate Finance II | 4 |
|  |  | 4 |


| RE 573/USP | Real Estate Economics | 4 |
| :--- | :--- | :--- |
| 573 |  |  |
| RE | Real Estate Law I |  |
| 538S/USP |  |  |
| 538 |  | 4 |
| Project Development | 3 |  |
| USP 523 | Real Estate Development I | 3 |
| USP 546 | Real Estate Development II | 3 |
| USP 624 | Development Project Design | 3 |
| RE 531 | Executive Perspectives on Real | 1 |
| RE 562 | Estate | Real Estate Development |

## Subtotal: 55

## REAL ESTATE DEVELOPMENT WORKSHOP

The culminating experience of the MRED is RE 562 Real Estate Development Workshop. Students in that class form a team that produces a development proposal for a multiblock site in a major city, advised by local industry profes sionals. Each team will produce a professional report and present their findings before an audience of realestate professionals.

## MASTER OF TAXATION (MT)

The Master of Taxation (MT) provides the specialized tax knowledge and skills required to start or advance a career as a tax profes sional. The foundation of the curriculumis the immersion of students in primary source authority, such as the Internal Revenue Code, Treasury regulations, and judicial and administrative authority. Skill development is focused on strengthening analytical, research, and written and oral communication skills. The programis designed to develop the taxexpertise of a wide range of students, including current undergraduate accounting majors with a 3.0 orhigher GPA in theirupper division accounting courses, bachelor degree holders outside of accounting that complete a specified set of upper divis ion accounting courses with a 3.0 or higher GPA, bachelor degree holders in accounting currently employed in a tax-related field, and holders of a J.D.

The MT is a 45 -credit-hour program, with cohorts starting in Summer term, which can be completed over 12 months (full-time) or 24 months (part-time). The programis a hybrid of in-class and online content: each course begins with a live on-campus class on a weekend at the startof each termand continues online thereafter, with both synchronous and as ynchronous interactions among faculty and students. Faculty for the MT programare drawn from Portland State University and both local and nationally recognized professionals with expertise in specialized areas
of taxation.

## REQUIRED TAXATION CORE COURSES*

The MT programrequires a minimum of 45 credits.

| MTax 525 | Tax Research and Writing | 4 |
| :---: | :---: | :---: |
| MTax 526 | Tax Accounting Methods and Periods | 4 |
| MTax 527 | Corporate Taxation I | 4 |
| MTax 528 | Corporate Taxation II | 4 |
| MTax 530 | Taxation of Property <br> Transactions | 2 |
| MTax 531 | Pass-through Entities I | 4 |
| MTax 532 | Pass-through Entities II | 2 |
| MTax 533 | Financial Accounting for Income Taxes | 4 |
| MTax 537 | Tax Case Capstone | 3 |
| MTax 544 | Professional Practices Seminar | 2 |

Subtotal: 33 Credits

## TAX ELECTIVES*

Students will complete twelve credits from the following courses:

| MTax 535 | State and Local Taxation | 4 |
| :--- | :--- | :--- |
| MTax 536 | International Taxation | 4 |
| MTax 539 | Taxation of Estates, Gifts, and | 4 |
|  | Trusts |  |
| MTax 540 | Practicum/Internship | 4 |
| Actg 553 | Financial Statement Analysis | 4 |

Subtotal: 12 Credits

## Graduate Certificates

## ATHLETIC \& OUTDOOR INDUSTRY GRADUATE CERTIFICATE

The Athletic \& Outdoor Industry Graduate Certificate provides students with a tool kit and an understanding of the culture, process, terminology and what it takes to succeed in a hyper competitive industry. The A\&O Industry Graduate Certificate helps students prepare for careers in the A\&O industry or advance their career by providing an overview of a go-to-market strategy, and help themexpand their network of industry contacts.

The programdifferentiates its elf with strong industry engagement and experiential learning. Industry professionals actively participate in the classroomas
teachers, guest speakers and mentors offering tangible examples and insights.

The A\&O certificate was designed as a complement to a School of Business graduate programincluding the MBA, MSGSCM, orMSF. It can also be taken as a stand-alone; priority is given to students enrolled in School of Business graduate programs.

## REQUIREMENTS

Industry or related experience or education is strongly preferred.

## Courses

| Mktg 514 | Selling and Sales Leadership | 4 |
| :--- | :--- | :--- |
| Mktg 534 | Advertising and Brand | 4 |
|  | Management |  |
| Mktg | Athletic and Outdoor Marketing | 4 |
| $536 / \mathrm{Mktg}$ |  |  |
| 536 S |  |  |
| Mktg | Product Management in the | 4 |
| $537 / \mathrm{Mktg}$ | Athletic and Outdoor Industry |  |

537S
Hectives*
Choose one course fromthe following:
GSCM 511 Principles of Strategic Global Sourcing
GSCM 516 Global Supply Chain Forecasting and Production Planning
BTA 519 Managerial Analytics
Mktg 513 Pioneering Innovation
Enrollment in electives is based on space and av ailability.
*MBA students will need to choose an elective class that is not currently required as part of the MBA program. Specifically they will choose fromForecasting and Production Planning (GSCM 516) or Principals of Global Sourcing (GSCM 511).

## BUSINESS BLOCKCHAIN GRADUATE CERTIFICATE

The objectiveof the Business Blockchain Certificate is to provide students with knowledge of blockchain and distributed ledger concepts and an understanding of how these technologies can transformbusinesses and industries. The program will equip students with the ability to 1) use analytical skills to address technical and business problems ,2) work with distributed ledger technologies, and 3) respondeffectively to blockchain-relatedchanges and opportunities in their companies and industries. Because all functional areas of business will be affected by blockchain technology, students fromany business undergraduate concentration or business graduate programcan strengthen their business knowledge and skill by adding the certificate to their degree programs.

| BTA | Blockchain Fundamentals | 4 |
| :--- | :--- | ---: |
| 581/BTA |  |  |
| 581S |  |  |
| BTA | Blockchain Fundamentals Lab | 2 |
| 582/BTA |  | 4 |
| 582S |  |  |
| BTA | Blockchain in Business |  |
| 583/BTA |  | 2 |
| 583S |  |  |
| BTA | Blockchain in Business Lab |  |
| 584/BTA |  | 2 |
| 584S |  |  |
| BTA | Blockchain Uses and |  |
| 585/BTA | Applications |  |
| 585S |  |  |
| BTA | Emerging Topics in Blockchain | 2 |
| 586/BTA |  |  |
| 586S |  |  |
| Total Credit Hours: 18 |  |  |
| GRADUATE CERTIFICATE IN REAL ESTATE |  |  |
| INVESTMENT AND FINANCE |  |  |

The Graduate Certificate in RealEstate Investment and Finance provides students with the knowledge and analytical tools relevant to, amongst others, analyzing real estate investments, making financial decisions, valuing real estate assets, and assessing market demand \& supply. The Certificate prepares students for careers in reales tate investment, lending apprais al, corporate real estate management, investment brokerage, real estate FinTech, affordable housing finance, and property management. This graduate certificate can be taken remotely.

## REQUIRED COURSES

| RE 521 | Real Estate Finance I | 4 |
| :--- | :--- | :--- |
| RE 522 | Real Estate Finance II | 4 |
| RE 539/RE | Real Estate Valuation I | 4 |
| 539S |  |  |
| RE 548 | Real Estate Market Analysis | 3 |

Subtotal: 15
MRED students must find a 4-credit substitute for RE 522.

## ELECTIVES

Choose one course from the following list:

| Actg 511 | Financial Reporting | 4 |
| :--- | :--- | :--- |
| Actg 550 | Advanced Financial Reporting | 4 |
| BTA | Blockchain Fundamentals | 4 |

581S/BTA
581

| MTax 530 | Taxation of Property | 2 |
| :--- | :--- | :--- |
| MTax 538 | Transactions <br> Taxation of Real Estate <br> Transactions | 2 |
| RE 523 | Real Estate Investment Analytics | 4 |
| RE 532/RE | Multifamily Property | 4 |
| 532S | Management |  |
| RE 533/RE | Commercial Property and Asset | 4 |
| 533S | Management |  |
| USP 596 | Affordable Housing Finance | 3 |

Subtotal: 3-4
Total CreditHours: 18-19

## BUSINESS INTELLIGENCE AND ANALYTICS GRADUATE CERTIFICATE

The Certificate in Business Intelligence and Analytics (Grad Cert BIA) is designed to meet the growing demand for advanced data analysis and communication skills. These skills will permit graduates to optimize the interconnection of devices, analy ze large quantities of data, and harness information into useful decision-making models.

This certificate is intended for those who want to optimize their quantitative skills and develop the competence required to communicate data driven decisions within their org anizations. The Grad Cert BIA graduate will be able to analyze ever growing quantities of data and contextualize this information through four areas of study; engineering management, systems science, mathematicalstatistics, and business communications.

| Courses |  |  |
| :--- | :--- | :---: |
| ETM 538 | Decision Support Systems: Data <br>  <br> WTM 540 | 4 |
| Warehousing | Operations Research | 4 |
| Stat 564 | Applied Regression Analysis | 3 |
| SySc 531 | Data Mining with Information <br> Theory | 4 |
| BTA 520 | Introduction to Business | 4 |
|  | Intelligence and Analytics | 4 |
| BTA 521 | Data Visualization | 2 |

Subtotal: 21
ETM 538, ETM 540, Stat 564, and Sy Sc 531 may be taken in any order but are prerequisites for BTA 520; BTA 520 is a corequisite to BTA 521.

## GLOBAL SUPPLY CHAIN MANAGEMENT GRADUATE CERTIFICATE

The GSCM certificate is designed as a standalone certificate for working professionals with significant work experience in business operations to gain an academic
credential for advancement in their career. The certificate is also available to MBA students.

## CORE COURSES

| GSCM 511 | Principles of Strategic Global | 4 |
| :--- | :--- | :--- |
| GSCM 513 | Sourcing <br> Principles of Strategic Global <br> Logistics | 4 |

Subtotal: 8

## ELECTIVES

Choose two of the following:

| GSCM 514 | Reverse Logistics and Closed <br> Loop Supply Chain | 4 |
| :--- | :--- | :---: |
| GSCM 515 | Global Case Studies in Supply <br> Chain Management | 4 |
| GSCM 571 | Business Analytics I | 4 |
| GSCM 572 | Business Analytics II | 4 |

Subtotal: 8

Total Credit Hours: 16

## HUMAN RESOURCE ANALYTICS (HRA) GRADUATE CERTIFICATE

A growing number of org anizations use human resource analytics (HRA) to informand support strategy and to maintain a competitive advantage. Yet, a talent shortage has emerged, leaving many org anizations searching for individuals who understand how to apply and implement HR analytics. The objective of the HRA Graduate Certificate is to address this talent shortage by developing knowledge and skills in HR analytics. Through hands-on application of data management,analysis, and visualization, using tools such as R and Tableau, HR professionals and graduate students with an interest in HR will learn how to answer HR questions using data and to grow an organization's HR analytics capabilities. By the end of the certificate, students will be able to choose and implement appropriate data-analytic tools; follow ethical and legal standards; and improvecritical organizational functions, such as staffing, learning and development performance management, and retention.

## CERTIFICATE REQUIREMENTS

The HRA Graduate Certificate is an 18 credit program.

| Course of study |  |  |
| :--- | :--- | :--- |
| Mgmt 541 | Introduction to HR Analytics | 4 |
| Mgmt 542 | HR Analytics Tools and | 4 |
|  | Applications |  |
| Mgmt 543 | HR Metrics and Analytics in | 2 |
|  | Daily Operations <br> Mgmt 548 | Special Topics in HR Analytics |
| Mgmt 552 | HR Analytics Capstone | 2 |
| Mgmt 553 | HR Data Visualization and | 4 |
|  | Storytelling | 2 |
|  |  |  |

Subtotal: 18
Total CreditHours: 18

## REAL ESTATE DEVELOPMENT CERTIFICATE

Administered by the College of Urban and Public Affairs (p. 384) (CUPA) A concentration centering on is sues of property development, finance and real estate, and housing economics.

## SOCIAL INNOVATION AND SOCIAL ENTREPRENEURSHIP GRADUATE CERTIFICATE

Portland State University's social innovation and social entrepreneurship certificate equips you to bring meaning and purpose to your career in business or nonprofit leadership by training you to create practical, effective solutions to social and environmental challenges.
Whether you're a socialentrepreneur starting something new, or an intrapreneur inside a mission-driven organization, this programcan prepare you with the experience and skills to innovate. You can either design a new social venture-nonprofit, business, government programor advocacy campaign-to address an is sue that matters to you, or evaluate and suggest improvements to an existing org anization of your choice.

## CERTIFICATE REQUIREMENTS

Graduate Certificate Requirements
Mgmt
Design Thinking for Social
521S/Mgmt
Innovation
521
And
Mgmt 522S Money Matters for Social Innovation
or
PA $541 \quad$ Social Entrepreneurship
or
Mktg 513

| Mgmt 523S | Storytelling and Impact <br> Measurement for Social <br> Innovation | 4 |
| :--- | :--- | ---: |
|  | And |  |
| Mgmt 509S | Social Innovation Practicum <br> or | 4 |
| PA 509 | Organizational Experience <br> or | $3-6$ |
| HSMP 509 | Practicum <br> or <br> MBA InternationalExperience | 4 |
| Fin 575 | or <br> Impact Ventures | $1-9$ |

Subtotal: 16

## TAXATION GRADUATE CERTIFICATE

The Graduate Certificate in Taxation (GCT) allows accounting majors, and current practitioners, the opportunity to further their taxeducation. This programis aimed at recent accounting graduates seeking a limited number of graduate tax classes to prepare for entry into tax careers as well as practicing attorneys, accountants and other taxprofes sionals seeking expertise in selected areas of taxation. Tax practitioners (including accountants and attorneys) often focus their practice to specific areas of taxation. The GCT allows a focused approach whereby only certain areas of taxation are targeted for study, allowing for an efficient use of time and financial resources in meeting needed educational requirements.
The GCT places emphasis on a thorough grounding in tax research and writing, and then allows students to further design a specific course of study focusing on their area of interest (e.g. corporations, state and local tax, international tax, trust, estate and gift, etc.).

## REQUIREMENTS

The GCT is a 20 credit program; a 4-credit required course and 16 credits of elective courses.

## Required

MTax 525 Tax Research and Writing
4
Electives (select 16 credits)
MTax 526 Tax Accounting Methods and

## Periods

MTax 527 Corporate Taxation I 4
MTax $528 \quad$ Corporate Taxation II 4
MTax 530 Taxation of Property 2
Transactions
MTax 531 Pass-through Entities I
MTax 532 Pass-throughEntities II 2


$\square$


| MTax 533 | Financial Accounting for Income | 4 |
| :--- | :--- | :--- |
| MTax 535 | Taxes | State and Local Taxation |

## COLLEGE OF EDUCATION

## Jose Coll, Interim Dean

Tina Anctil, As sociateDean for Academic Affairs
Vanport Building 1810 SW 5th Ave, Suite 220, 503-7254619
www.pdx.edu/education

## Graduate Programs

- Principal and Professional Administrator Licenses
- Early Childhood Education
- Elementary Education
- Middle LevelEducation
- High SchoolEducation-In cooperation with appropriate departments
- Specialist Programs-AdministrativeStudies (P-12); Postsecondary, Adult and Continuing Education; Counselor Education (options: School, Clinical Mental Health, Clinical Rehabilitation, Marriage, Couple and Family); Literacy Education; Special Education, ESOL/Bilingual Education
- M.Ed., M.A., M.S.-Education
- M.A.T., M.S.T.-In cooperation with appropriate departments
- Ed.D.-Educational Leadership (Options: Administration; Curriculumand Instruction; Postsecondary Education; Special Education)
The College of Education (COE) has a wide range of comprehensive programs leading to degrees and licensure. It is authorized by the Oregon Teacher Standards and Practices Commission to recommend teacher education and specialist candid ates for both initial licenses and added endorsements.
COE programs are fully accredited by the Council for the Accreditation of Educator Preparation (CAEP) and by the Oreg on Teacher Standards and Practices Commis sion (TSPC). Counselor Education programs are accredited by the Council for Accreditation of Counseling and Related Educational Programs (CACREP). Although licensure requirements are incorporated into degree programs, changes by the TSPC during the life of this catalog may alter the requirements. Applicants for licenses must meet the TSPCrequirements in force at the time of the license application. $\dagger$
$\dagger$ Because licensurerules are controlled by the Oregon TeacherStandards and Practices Commission, it is possible that licensure requirements may change. All pers ons expecting to be recommended for initial (preliminary) or continuing (professional) licenses should consult with an
adviser or contact the College of Education Licensure Office, 503-725-4758.
COE Vision: Educators and counselors create a just and equitable world.
COE Mission: We empower educators and human services professionals to engage in visionary thinking and transformative practices within schools and communities.


## COE Values:

- Inclusiveness: we are welcoming and equity focused.
- Responsiveness: we mindfully serve our students and communities
- Engagement: we are connected and collaborative partners
- Creativity:we are innovative and create knowledge
- Impact: we are data-driven, process-oriented, and accountable
From the Pacific Northwest, the PSU College of Education serves the world through comprehensive offerings that educate a large and diverse student body for careers in teaching, counseling, and educational leadership:
- We educate graduate students, undergraduates, current practitioners, returning students, and those who are changing careers
- Our research connects us to a community of scholarship and positively impacts teaching and learning
- Our focus on inclusive excellence draws students to the PSU College of Education


## Undergraduate programs

Undergraduates tudents interested in purs uing a career in teaching should refer to the "Teacher Preparation (p.321)" section in this catalog for information regarding recommended preparatory programs for elementary and secondary teachers.

## SPECIAL EDUCATION B.A./B.S.

In addition to meeting the general University requirements, the student must complete a minimum of 75 credits in the following special education courses.

## LOWER-DIVISION PROGRAM REQUIREMENTS



| These requirements are completed in Junior and Senior years ( $\mathrm{Yr} 3 \& 4$ ). |  |  |
| :---: | :---: | :---: |
| SpEd 411 | Foundations of Special | 3 |
|  | Education |  |
| SpEd 415 | ClassroomAssessment, | 4 |
|  | Instruction, and Behavior |  |
|  | Management(Elementary) |  |
| SpEd 430 | Families and Advocacy |  |
| SpEd 409 | Professional Practices Seminar 1 |  |
| SpEd 437 | Reading Assessment and |  |
|  | Instruction-Elementary |  |
| SpEd 438 | Reading Assessment and | 4 |
|  | Instruction-Secondary |  |
| SpEd 432 | Inclusive Practices | 2 |
| SpEd 414 | Legal and Ethical Foundations of | 3 |
| SpEd 412 | Diagnostic Assessment | 4 |
| SpEd 448 | Positive Behavior Support in the | 3 |
|  | Classroom |  |
| SpEd 409 | Professional Introduction to the | 3 |
|  | School Year |  |
| SpEd 433 | Math Assessment and Instruction | 3 |
| SpEd 422 | Comprehensive Individualized | 3 |
|  | Assessment and CurriculumI |  |
| SpEd 409 | Professional Practices Seminar 2 | 3 |
| SpEd 423 | Comprehensive Individualized | 3 |
|  | Assessment and CurriculumII |  |
| SpEd 425 | StudentTeaching | 12 |
| SpEd 426 | IEP and Collaborative Teaming | 4 |

## Total Credit Hours: 75

## Transfer Policy for the Special Education Major Requirements in the BA/BS in Special Education

Students must complete a minimum 64 Special Education major requirements at PSU. These are the Special Education courses completed during the junior and senior years.

## CAREER AND COMMUNITY STUDIES CERTIFICATE

The programmatic focus of this pre-baccalaureate certificate is to develop knowledge and competencies for adult life and employment through inclusive academic, careerdevelopment/employment, and social/community engagement experiences. Each student's CCS certificate programof study begins with a person-centered planning (PCP) meeting that includes: a) the student's choices of coursework to take, finding/maintaining paid employment and getting involved on campus; b) identification of needed individualized support services for college success (e.g., advising, individual learning plans (ILP) for college courses, academic coaching, career development and employment supports, etc.) and c) prepare for the start of college life. Each year across the 4 -year college experience, students will participate and eventually lead their PCP meetings to fully engage in their college experience, establish goals, envision life after college, and develop their capacity to manage their individualized supports and make informed decisions about their future. Academic success, meaningful, integrated employment and socialengagement within their communities are the anticipated outcomes after certificate completion. The CCS certificate culminates in an ePortfolio summarizing the student's academic and career/employment experiences and competencies.

Admiss ion to this programis limited; please contact the College of Education for information.

The Certificate of Career \& Community Studies is designed as a four-year college experience as shown below:

| Year 1 |  |  |
| :--- | :--- | ---: |
| SpEd 120 | Freshman Inquiry | 15 |
|  | Career and Community Studies | 6 |
|  | First Year of Study |  |

Subtotal: 21
Year 2
SpEd $220 \quad$ Career and Community Studies $\quad 6$
Second Year of Study
Courses that support career and 12-
other interests 18
Subtotal: 18-24
Year 3
SpEd 320

Career and Community Studies 6
Third Year of Study
Courses that support career and 12other interests

Subtotal: 18-24

## Year 4

| SpEd 420 | Career and Community Studies | 6 |
| :--- | :--- | ---: |
|  | Fourth Year of Study |  |
|  | Courses that support career and | $12-$ |
|  | other interests | 18 |

Subtotal: 18-24
Subtotal: 75-93
Total Credit Hours: 75-93

## Graduate programs

## ADMISSION REQUIREMENTS

To be admitted to a graduate programin profes sional education, the applicant must first satisfy minimum University requirements (p. 42). The applicant must also meet the admission requirements of specific degree, license, or specialist programs that the school is authorized to offer. Detailed information reg arding admis sion requirements for the various graduate programs is available from the College of Education and at www.pdx.edu/education.

## DEGREE REQUIREMENTS

See University graduate degree requirements (p. 52). Specific College of Education requirements for degree, educational specialis ts, or license candidates are listed below. Upon successful completion of all University and College of Education requirements, thecandidate will be awarded the appropriate degree and berecommended, upon request, for the appropriate license.

COUNSELING M.A./M.S.
All students who are pursuing a Master's Degree in Counselor Education must complete core courses with some additional work needed based on program requirements. This programsatisfies University and College of Education requirements and is part of the requirements needed prior to taking the NCE examination of the National Board for Certified Counselors (NBCC) or the CRC examination of the Commis sion on Rehabilitation Counselor Certification (CRCC). This programis also approved by the Oregon Board of Licensed Professional Counselors and Therapists and the Teacher Standards and Practices Commis sion of Oregon. Students should work with their advisers in the process of understanding the licensure requirements of both of these credentialing groups.

The primary purpose of the Counselor Education department is to educate competent counselors for public
and private schools, community behavioralhealth agencies and rehabilitation settings. The programis designed to strengthen competencies in the behavioral sciences and to broaden the students' background in human growth and development, counseling theories and interventions, interpersonal relations, individual and group processes, career counseling, assessment, diagnosis and treatment planning, research and programevaluation, and multicultural aspects of counseling.

Students may pursue one of four areas of specialization within the Counselor Education department: Clinical MentalHealth Counseling; Clinical Rehabilitation Counseling; School Counseling; Marriage, Couple, and Family Counseling. This is primarily an evening program. The programtakes three years to complete.

Students can choose (a) written comprehensive exam, (b) thes is, or (c) profes sional portfolio (forschool counseling students only). Thesis credits are in addition to the required credits for graduation. The thesis must be no less than 6 credits and no more than 9 credits.

Note: Students in all four specializations must complete COUN 541 Introduction to Counseling and one course in psychopathology prior to admission or before enrollment in the fall term of the first sequence of coursework. Additional prerequisites are specified for students in the School Counseling specialization (see "Licensure (p. 150)"). Courses numbered 808 are not allowed.

## Core courses (56 credits)

Coun 504 Internship 12
Coun 509 Practicum: Group Counseling 1
Coun 509 Practicum: Counseling 6
Coun 509 Practicum: Peer Supervision 2
Coun 531 Foundations of Addictions 3
Coun 543 Interpersonal Relations II 3
Coun 551 Theories and Interventions I 3
Coun 566 Appraisal Instruments 1
Coun 567 Using Tests in Counseling 3
Coun 568 Career and Lifestyle Planning 3
Coun 569 DevelopmentalFoundations of 3
Coun 570 Ethical and Legal Is sues in 3
Coun 571 Group Counseling 3
Coun 580 Supervision 1
Coun 581 Multicultural Perspectives in 3
Coun 582 Research and Program 3
3

## Coun 585 Diagnosis and Treatment Planning I

## Clinical Mental Health Counseling Specialization

The Clinical Mental Health Counseling specialization prepares individuals to work as counselors in a range of private and public clinical mental health settings, including outpatientand inpatient treatment agencies, community mental health, counseling centers at colleges and universities, and in private practice. This program intentionally integrates a multicultural and social justiceoriented lens throughout our coursework and clinical experiences. The program of study leading to an M.A./M.S. in Counselor Education with a Clinical Mental Health Counseling specialization must include the following 90 credits, in addition to the core CACREP curriculum:

## Courses

| oun 544 | Consultation:Theory and |
| :---: | :---: |
|  | Practice |
| Coun 546 | Grief and Loss |
| Coun 552 | Theories and Interventions II |
| Coun 553 | Advanced Therapeutic Strategies |
| Coun 572 | Systemic Perspectives on Human Sexuality |
| Coun 575 | Foundations of Couples, Marriage, and Family Counseling |
| Coun 577 | Family Therapy or |
| Coun 578 | Couples Therapy |
| Coun 586 | Psychopharmacology and Mental Illness |
| Coun 587 | Foundations of Mental Health Services |
| Coun 588 | Diagnosis and Treatment |
|  | Planning II |
|  | Electives |
| Coun 584 | Crisis Assessmentand |

Coun 552
Advanced Therapeutic Strategies ..... 3
Coun 572
SexualityCoun 577Family Therapy3
Coun 58 Couples Theray ..... 3
Coun 586 Psychopharmacology and Mental ..... 3335
Coun 584Intervention

## Clinical Rehabilitation Counseling Specialization

Clinical Rehabilitation Counselors provide services to individuals with dis abilities who are psychologically and vocationally adjusting to the dis ability experience. The Clinical Rehabilitation Counseling programprepare graduates to work in a wide variety of clinical mental health and rehabilitation settings, including public mental health agencies, public and private community counseling agencies, employee assis tance programs, day treatment and inpatient hospital settings, private practice, group practice, community colleges, university settings, and public and private vocational rehabilitation agencies. Our CRC master's degree is organized around core foundation courses, an intensive on-campus practicumtraining clinic experience, interpersonal growth experiences, adv anced
theory and practice courses, and a culminating half-time field interns hip placement. Our programconsists of 90 graduate credits designed to meet CACREP national accreditation standards forprofessional counselors and the academic degree requirements to become licensed as a Licensed Professional Counselor (LPC) in Oregon and otherstates.

## Courses

|  | Core coursework | 56 |
| :--- | :--- | ---: |
| Coun 552 | Theories and Interventions II | 3 |
| Coun 575 | Foundations of Couples, <br> Marriage, and Family Counseling | 3 |
| Coun 586 | Psychopharmacology and Mental | 3 |
| Coun 588 | Illness | Diagnosis and Treatment <br> Coun 590 |
| Planning II <br> Foundation of Rehabilitation | 3 |  |
| Coun 591 | Counseling <br> Coun 5edical Aspects of Dis ability | 3 |
| Coun 593 | Psychosocial Aspects of | 3 |
| Coun 594 | Disability <br> Case Management <br> Occupational | 3 |
| Coun 595 | Analysis/VocationalEvaluation <br> Contemporary Issues and | 3 |
|  | Applications in Rehabilitation <br> Counseling | 3 |
|  | Elective | 3 |

Subtotal: 90

## Marriage, Couple, and Family Counseling Specialization

The Marriage, Couple, and Family Counseling Program prepares individuals for specialized practice with relationships and families. The programemphasizes developmental systems thinking and relationship-focused counseling skills, with special attention paid to sociocultural factors, equity, and social justice in relationship and family practice. Graduates are trained to work as professional counselors in mental health centers, community agencies, private practice, and additional settings. The programleads to an M.A./M.S. in Counselor Education with specialty in Marriage, Couple, andFamily Counseling, and requires completion of the following 90 credits:

## Courses

$$
\text { Core coursework } 56
$$

Coun 552 Theories and Interventions II ..... 3
Coun 572 Systemic Perspectives on Human ..... 3
Sexuality
Coun 573 Contemporary Couples, ..... 3
Marriage, and Family Systems
Coun 574 Family Life Cycle andTransitions

| Coun 575 | Foundations of Couples, Marriage, and Family Counseling | 3 |
| :---: | :---: | :---: |
| Coun 577 | Family Therapy | 3 |
| Coun 578 | Couples Therapy | 3 |
| Coun 579 | Advanced Systemic | 3 |
|  | Interventions: Couples and Families |  |
| Coun 555 | Counseling Children and Youth | 3 |
| Coun 588 | Diagnos is and Treatment | 3 |
|  | Planning II |  |
| Coun 544 | Consultation:Theory and | 2 |
| Coun 546 | Grief and Loss | 2 |

Subtotal: 90

## School Counseling Specialization

The SchoolCounseling specialization prepares individuals to work as counselors in school settings (P-12). Emphas is is placed on preparing school counselors to work with students to support themin the process of achieving academic, career, and personal/social success. Students who have a teaching license and two years teaching experience take 6 additional elective credits (TrackI). Students who cannot document a teaching license and two years of teaching experience mustcomplete a 6 -credit, 200- hour Effective Teaching sequence to obtain licensure as a school counselor (see "Licensure (p. 157)")(Track II).
Courses

|  | Core coursework | 56 |
| :---: | :---: | :---: |
| Coun 526 | Effective Teaching (Track I, 0 cr.; Track II, 6 cr.) | 0 or 6 |
| Coun 527 | Counseling Individuals with Diverse Needs | 3 |
| Coun 545 | Youth at Risk | 3 |
| Coun 546 | Grief and Loss | 2 |
| Coun 547 | Legal \& Ethical Issues in School Counseling | 1 |
| Coun 555 | Counseling Children and Youth | 3 |
| Coun 575 | Foundations of Couples, Marriage, and Family Counseling | 3 |
| Coun 576 | Parents, Families, and Communities in Schools | 3 |
| Coun 589 | Action Research in Counseling | 5 |
| Coun 596 | Foundations of School Counseling | 3 |
| COUN | Electives (Track I, 8 cr.; Track | 2 or |
| Electives | II, 2 cr.) | 8 |

Subtotal: 90
CURRICULUM AND INSTRUCTION M.A./M.S.
The College of Education's Curriculumand Instruction Master's Degree Programoffers an innovative learning
environment thatengages and empowers individuals to develop the knowledge, skills, and dispositions to improve their professional practice and to become leaders for change and social justice in their learning communities. The Programis designed for professionals who want to pursue advanced studies in teacher leadership, educational theories and research, curriculumdesign, and instructional practices. Courses are intended to enhance equitable pedagogy and learning outcomes while providing opportunities for career development. The Program electives are flexible and can be used toward endorsements (e.g.ESOL, Reading), specializations (e.g.,, Math), and Certificates of Completion (e.g. Teacher Leadership, ESOL, AutismSpectrumDisorder).

## REQUIREMENTS FOR THE DEGREE ARE:

1. A program of study consisting of 45 graduate-level credits approved by the student's graduate adviser and the department chair, to include:
a. A minimum of 24 core credits in curriculum and instruction.
b. A core of studies encompassing preparation in the areas of teaching and learning, curriculum, research and evaluation, human relations, and multicultural education. The precise nature of this core of studies is specified by the department. Degree plans are written in cooperation with an as signed adviser.
c. All courses must be 500 level or above.
d. No more than 6 credits may be 800 -level courses numbers, if approved by the adviser prior to being used for a master's program. Courses numbered 808 are not allowed.
e. With adviser and department chair approval, up to 15 credits may be transferred in fromother institutions.
f. With adviser and department chair approval, up to 15 credits fromPSU taken prior to admission may be included in the program.
g. The total credits of (e.) and (f.) cannot exceed

## 15.

2. The student will select one of threeoptions to complete the requirements for the master's degree: (1) an independentaction research project, (2) a thesis, or (3) a written comprehensive examination. The thesis requires an oral examination in addition to the written product.

| Core Classes ( $\mathbf{2 4}$ credits) |  |  |
| :---: | :---: | :---: |
| CI 510 | Guidance for the Clas sroom | 3 |
|  | Teacher |  |
| CI 561 | Advanced Educational | 3 |
|  | Psychology |  |
| CI 565 | Theoretical Models of | 3 |
|  | Curriculum |  |
| CI 567 | Curriculum and Culture | 3 |
| CI 580 | Theories of Ins truction | 3 |
| CI 581 | Issues in Education | 3 |


| CI 590 | Action Res earch Proposal | 3 |
| :--- | :--- | :--- |
| CI 591 | Action Research Implementation | 3 |

## Early Childhood Specialization

The College of Education offers graduate-level courses for profes sionals seeking to strengthen their understanding and skills in the area of early childhood education (ECE). This coursework focus is appropriate for those pursuing a master's degree in curriculumand instruction with a specialization in ECE.

## EARLY CHILDHOOD: INCLUSIVE EDUCATION M.A./M.S.

This innovative early childhood education master's degree programemphas izes educating professionals to welcome multiple perspectives, en gage all members of the community, experiment and build theories, make learning and listening visible, and think deeply together. Students develop a critical understanding of the role of development, diversity, and culture in the lives of young children and their families and their communities. Knowledge of inclusive early childhood ideas and practices foster the leadership necessary to ensure equity for all children.

Students have a choice of four specialty areas: Constructivismin Early Childhood, Early Childhood Special Education, Infant ToddlerMental Health, and a Dis tributed Pathway that draws from the other three specializations. All students will participate in core courses with a distinct focus on inclusive education and complete a culminating action research project focused on their own practice.

| Constructivism |  |  |
| :---: | :---: | :---: |
| Courses |  |  |
| ECED 571 | Play: Curriculum in Early | 3 |
|  | Childhood Education |  |
| ECED 573 | Assessment and Technology in Early Childhood Education | 3 |
| ECED 577 | Learning Designs: Early | 3 |
|  | Childhood Environments |  |
| ECED 578 | Constructivist Curriculum: Big | 3 |
|  | Ideas in Early Childhood |  |
|  | Education |  |
| Six credits chosen from the following options: |  |  |
| ECED 526 | Mathematical Thinking in Early | 3 |
|  | Childhood |  |
| ECED 529 | Art as Languages of Early | 3 |
|  | Childhood |  |


| ECED 572 | Language and Literacy in Early <br> Childhood Education | 3 |
| :--- | :--- | :--- |
| ECED 579 | Young Child as Scientist | 3 |

Subtotal: 18
Early Childhood Special Ed
Courses

| ECED 528 | Educational Rights and Inclusive <br> Environments in Early | 3 |
| :--- | :--- | ---: |
| ECED 560 | Childhood <br> Inclusive Early Childhood | 3 |
| SpEd 580 | Models <br> Introduction to Early <br> Intervention/Early Childhood | 3 |
| SpEd 581 | Special Education <br> Family Guided Early <br> Intervention | 3 |
| SpEd 582 | Specialized Techniques:Early <br> Intervention/Early Childhood | 3 |
| SpEd 587 | Special Education <br> Introductionto Infant Toddler <br> MentalHealth | 3 |

Subtotal: 18

## Infant Toddler Mental Health

| Courses <br> SpEd 587 | Introduction to Infant Toddler <br> Mental Health <br> or <br> Another course with advis or <br> approval | 3 |
| :--- | :--- | ---: |
| Coun 520 | Collaborative Partnerships to <br> Support Infants and Toddlers | $1-3$ |
| ECED 585 | Dynamic Models of <br> Infant/Toddler Development <br> AssessmentMethods and | 3 |
| SpEd 594 | Classification in Infant Mental | 3 |
| SpEd 595 | Health <br> Prevention and Intervention in | 3 |
| Coun 597 | Infant MentalHealth <br> Strengths, RiskFactors, and <br> Disturbance in Infants, Toddlers, <br> and Their Families | 3 |

Subtotal: 18

## General requirements

Core Courses
ECED 550
Foundations in Early Childhood and Inclusive Education or
ECED 553 Contemporary Is sues in Early
4
Childhood and Inclusive Education

| ECED 551 | Child Development and Critical <br> Perspectives in InclusiveEarly <br> Childhood Education | 4 |
| :--- | :--- | :--- |
| ECED 552 | Social Justice and <br> Transformative Practice in Early | 4 |
| CI 590 | Childhood Inclusive Education <br> Action ResearchProposal | 3 |
| CI 591 | Action Research Implementation | 3 |

Subtotal: 18

## Electives

Adviser approved electives taken $\quad 9$
within the College of Education
Subtotal: 9

## DistributedPathway

Take a minimum of two courses fromeach specialization with approval of adviser.

Subtotal: 18

## EDUCATIONAL LEADERSHIP AND POLICY M.A./M.S.

The Department of Educational Leadership and Policy (ELP) offers a department-wide Master of Arts and Master of Science degree with specializations in:Postsecondary, Adult, and Continuing Education (PACE); Leadership in Sustainability Education (LSE); and Educational Administration, Principal License plus MS/MA.
The purposeof these programs is to inspire and guide educational leaders in creating a socially just world. Through teaching, research and advocacy, the ELP department in spires and guides educational leaders to create collaborative, sustainable practices that advance equity and social justice in our communities.
All students admitted to the 45-credit master's program must complete four required courses from the Professional Studies Core. Within each specialization students may elect to develop, with their advisors, a general programor theme (specialemphasis or focus).

| Core Courses (16 credits) |  |  |
| :---: | :--- | :---: |
| ELP 511 | Principles of Educational <br> Research and Data Analysis I <br> Developmental Perspectives on <br> Adult Learning | 4 |
| ELP 520 | 4 |  |
| ELP 568 | Educational Organization and <br> Administration | 4 |
| ELP 551 | And Either <br> SocialFoundations of Education <br> or | 4 |
| ELP 554 | Philosophy of Education | 4 |

In consultation with the advisor, students must complete courses that support their area of specialization and select one of two options to complete the requirements for the master's degree (a thesis or a comprehensive examination). The majority of students complete the comprehensive exam which involves a professionally grounded theory-topractice project formally contextualized in the research literature. The thesis is likely to significantly extend a student's time to completion. Courses numbered 808 do not count toward degree completion. Further information about each of these areas of specialization may be obtained from the College of Education.
Information about specific specializations and licensure programs can alsobe found on our website.
MA/MS Postsecondary Adult and Continuing Education
MA/MS Leadershipfor Sustainability Education

Educational Administration:

- Professional Adminis trator License
- PrincipalLicense
- PrincipalLicense Plus Master's Degree
- First Nations Administrator and KnowledgeKeepers Program

Graduate Certificates:

- Teaching Adult Learners
- Student Affairs in HigherEducation
- Service-Learning and Community-Based Learning in HigherEducation
- Training and Development
- Sustainable Food Systems


## SPECIAL EDUCATION M.A./M.S.

The College of Education offers comprehensive programs for the professional preparation of students in special education. A master's degree in special education may be completed in conjunction with state licensure in special education or may be completed independently. For licensing information see"Programs Leading to Licensure: SpecialEducation"on Special Education Licensure Programs.

Students completing a master's degree must completethe special education master's degreecore program. The
master's core must total at least 9 credits. The remaining credits are drawn fromthe special education licensure programor other courses approved by the advisor. No more than 6 credits of 800 -level courses may be used, and courses numbered 808 are not allowed. The master's degree without Oregon licensure must total at least 45 credits (which includes the master's core).

## Core Courses

Students must complete SpEd 596 Topics in Special Education Research before SpEd 597 Topics in Special Education Is sues and Practices. Topics such as Literacy, English Language Learners, Positive Behavior Intervention Supports, and Students with SignificantDis abilities are offered. Students must fulfill a caps tone experience by choosing either to complete a special project (SpEd 506) or a master's thesis (SpEd 503) under the direction of a faculty advisor. The special project ( SpEd 506 ) must include a written product and presentation and align with the topic area chosen for SpED 597. With advisor approval students may take up to 9 credits of SpEd 596 and 9 credits of SpEd in three topic areas. Students opting to complete a thesis will follow Portland State University theses guidelines. Students are required to enroll in 3-6 credits of Special Project (SpEd 506) or 6-9 credits of Thesis (SpEd 503).

## The master's degree programincludes:

Advis or approved courses (from 30-
licensure programor electives) 36
SpEd 596 Topics in SpecialEducation 3 Research
SpEd 597 Topics in SpecialEducation Is sues and Practices
A combination of the following:

| SpEd 503 | Thes is <br> or | $6-9$ |
| :--- | :--- | :--- |
| SpEd 506 | Special Project | $3-6$ |

## Visually Impaired Learners Focus

Students completing the Master's programwith a focus on Visually Impaired Learners have the option of completing the Master's core programas described above or to complete SpEd 596, SpEd 597, an additional 6elective hours in specialeducation AND complete a proctored, written master's comprehensive examination.

For students with a focus on Visually Impaired Learners completing the master's degree programincludes:

Advisor approved courses (from 30licensure programorelectives)

## Option 1:

SpEd 596 Topics in Special Education Research

SpEd 597 Topics in SpecialEducation Issues and Practices
A combination of the following:
SpEd 503 Thesis 6-9
or
SpEd 506
Special Project
Option 2:
Electives with advisor approval
Complete proctored master's comprehensive examination

## Inclusive Elementary Educator Program

Students completing the Master's programas part of the Inclusive Elementary Educator Programmust satisfy the special education Master's core programrequirements by completing the required courses as follows:
Ed $530 \quad$ Introduction to Inclusion and 2
Ed 536 Educational Research and 3
Inclusive Education
SpEd $506 \quad$ Special Project 6
or
SpEd 503 Thesis
6

## EDUCATION M.ED.

The M.Ed. is earned by students who have completed PSU's Graduate Teacher Education Program(p. 150)
(GTEP) or Secondary Dual Educator Program(p. 153) (SDEP), and the Graduate level students in the Bilingual Teacher Pathway (p. 154) (BTP) Program. ITEP students may earn a M.Ed. with completion of coursework approved by their advis or.
Requirements listed below are for the M.Ed. only. Please refer to the licens ure sections linked above for additional requirements for the licensure programs.

## ELEMENTARY EDUCATION

| Ed 518 | Inclusive Elementary Clas srooms | 2 |
| :--- | :--- | :--- |
| ITP 514 | Educating for Equity and Social | 3 |
|  | Justice |  |
| ITP 534 | Foundations of Culturally and <br>  <br>  <br> Linguistically Responsive | 2 |
| ITP 536 | Practice at the Elementary Level <br> ITP 538 |  |
| ITP 540 | Integrated Methods | 3 |
| ITP 541 | Foundations of Literacy | 4 |
| ITP 542 | Literacies in the Elementary <br> Classroom | 4 |
|  | Integrated Elementary Science <br> Methods <br> ITP 535 | Cultivating Responsive |
|  | Elementary Classrooms | 2 |
|  |  | 1 |


| ITP 537 | Instructional Design and | 8 |
| :---: | :---: | :---: |
|  | Assessment |  |
| ITP 539 | Elementary Mathematics | 4 |
|  | Methods |  |
| ITP 543 | Profes sional Collaboration in Elementary Education | 6 |
|  |  | Subtotal: 45 |
| SECONDARY EDUCATION |  |  |
| Ed 519 | Inclusive Secondary Classrooms | 3 |
| ITP 516 | Engaging Young Adolescent | 3 |
|  | Learners |  |
|  | or |  |
| ITP 517 | Engaging Adolescent Learners | 3 |
| ITP 518 | Assessment for Learning | 2 |
| ITP 520 | Literacies in the Disciplines | 3 |
| ITP 529 | Professional Seminar-Secondary | 1 |
| ITP 513 | Technology as a Tool for | 3 |
|  | Learning |  |
| ITP 514 | Educating for Equity and Social | 3 |
|  |  |  |
| ITP 515 | Foundations of Culturally and | 3 |
|  | Linguistically Responsive |  |
|  | Practice at the Secondary Level |  |
| ITP 511 | ClassroomManagement for | 3 |
|  | StudentSuccess |  |
| ITP 512 | Learning and the Learner | 3 |
| ITP 521-528 | Secondary Methods | 10 |
| ITP 551 | Research and Clas sroomInquiry | 5 |
| ITP 509 | Practicum | 3 |
|  | Su |  |
| SECONDARY DUAL EDUCATION PROGRAM |  |  |
| Ed 507 | Seminar | 1 |
| Ed 581 | Inclusive Clas sroomResearcher | 2 |
| Ed 583 | Study Skills and Learning | 2 |
|  | Strategies |  |
| Ed 585 | Instructional Planning for | 3 |
|  | Inclusive Clas srooms |  |
| Ed 586 | Collaborative Teaching | 2 |
| Ed 587 | Inclusive Educational Research and Leadership | 2 |
| CI 543 | Effective Tchg Strategies \& | 3 |
|  | Materials for Working with |  |
|  | Linguistically \& Culturally |  |
|  | Diverse Stdnts |  |
| ITP 511 | ClassroomManagement for | 2 |
|  | StudentSuccess |  |
| ITP 512 | Learning and the Learner | 3 |
| ITP 514 | Educating for Equity and Social Justice | 3 |


| BBE 574 | DualLanguage - Biliteracy AssessmentC | 1 |
| :---: | :---: | :---: |
| BBE 580 | Inquiry and Reflective | 3 |
|  | Practitioner A |  |
| BBE 580 | Inquiry and Reflective | 3 |
|  | Practitioner B |  |
| BBE 580 | Inquiry and Reflective | 2 |
|  | Practitioner C |  |
| CI 543 | Effective Tchg Strategies \& | 3 |
|  | Materials for Working with |  |
|  | Linguistically \& Culturally |  |
|  | Diverse Stdnts |  |
| CI 596 | Second Language Acquisition and Development for K-12 | 3 |
|  | Educators |  |
| ELP 565 | ELL School Community | 3 |
|  | Relations |  |
| ELP 566 | Impact of Language and Culture in the Classroom | 3 |
|  | Sub |  |
| BILINGUAL TEACHER PATHWAY SECONDARY |  |  |
|  |  |  |
| CI 596 | Second Language Acquisition and Development for K-12 | 3 |
|  | Educators |  |
| CI 597 | Assessment of Language and | 2 |
|  | Content Learning for K-12 |  |
|  | English Learners |  |
| ITP 513 | Technology as a Tool for | 3 |
|  | Learning |  |
| ITP 516 | Engaging Young Adolescent | 3 |
|  | Learners |  |
|  |  |  |
| ITP 517 | Engaging AdolescentLearners | 3 |
| ITP 552 | Reflective Practitioner | 4 |
| BBE 534 | Planning, Assessment, and | 3 |
|  | Curriculum |  |
| BBE 524 | Professional Developmentand | 2 |
|  | Reflection |  |
| BBE 532 | Language and Literacy | 3 |
|  | Development for Diverse |  |
|  | Learners |  |
| ELP 565 | ELL SchoolCommunity | 3 |
|  | Relations |  |
| ELP 566 | Impact of Language and Culture in the Clas sroom | 3 |
| ELP 567 | ESL/Bilingual Program Design | 3 |
| SpEd 555 | Working With LEP Children | 2 |
|  | Who Have Special Needs |  |

1

BILINGUAL TEACHER PATHWAY SECONDARY

| CI 543 |  <br> Materials for Working with | 3 |
| :--- | :--- | ---: |
|  | Linguistically \& Culturally <br> Diverse Stdnts |  |
| ITP 511 | ClassroomManagement for | $1-3$ |
| ITP 512 | StudentSuccess |  |
| ITP 521-528 | Learning and the Learner | $1-3$ |
| ITP 551 | Recondary Methods | 8 | Subtotal: 55

## INTERNATIONAL TEACHER EDUCATION PROGRAM ELEMENTARY

| ITP 540 | Foundations of Literacy | 4 |
| :--- | :--- | ---: |
| ITP 539 | Elementary Mathematics | 4 |
|  | Methods |  |
| Ed 518 | Inclusive Elementary Clas srooms | 2 |
| ITP 514 | Educating for Equity and Social | 3 |
|  | Justice |  |
| ITP 537 | Instructional Design and | 4 |
|  | Assessment  <br>  Electives | 28 |

Subtotal: 45

## INTERNATIONAL TEACHER EDUCATION PROGRAM SECONDARY

| ITP 514 | Educating for Equity and Social | 3 |
| :--- | :--- | ---: |
|  | Justice |  |
| ITP 515 | Foundations of Culturally and | 3 |
|  | Linguistically Responsive |  |
|  | Practice at the Secondary Level |  |
| Ed 519 | Inclusive Secondary Classrooms | 3 |
| ITP 518 | Assessment for Learning | 2 |
| ITP 521-528 | Secondary Methods | 6 |
|  | Electives | 28 |

Subtotal: $\mathbf{4 5}$
EDUCATIONAL LEADERSHIP ED.D.
The Ed.D. in Educational Leadership, offered by the College of Education, is the school's highest professional degree. It is designed to prepare scholarly practitioners and to help formal and informal educational leaders develop their capacity to provide leadership that makes a positive and significant difference in the professional fields and diverse communities they serve. Emphasis is on the development of excellent professional performance as leaders in education in: public and private schools; community and four-year colleges and universities; community, state, and federaleducational agencies; and nonschool settings, where appropriate.

Four specializations are available to students: administration (PreK-12); curriculumand instruction; postsecondary education; and special education. Each student is admitted to one of the four specializations.

## GENERAL REQUIREMENTS

The programis a post-master's degree program. Students must have earned a master's degree or the equivalent prior to enrollment in the program. A minimum of 72 credits must be completed at Portland State University after admission to the doctoral program, to include the leadership core, specialization, and dis sertation. Courses numbered 800 or above are not allowed. Continuous enrollment is required. Foreign language competency is not required for the Ed.D. degree.

## Leadership core

| Ed 620 | Doctoral Studies Proseminar <br> Ed 630 | Principles and Practices of <br> Learning |
| :--- | :--- | ---: |
| Ed 640 | Organizational and Leadership <br> Theory and Research in | 4 |
| Ed 650 | Education <br> Educational Policy and Politics <br> Ed 660 | Foundations of Research <br> Paradigms and Methods |
| Ed 661 | Qualitative Research Methods in <br> Education | 4 |
| Ed 662 | Quantitative Research Methods <br> in Education | 4 |

## Specialization ( 27 credits minimum)

Students will complete a minimum of 27 hours of coursework in the following specializations:

- Administration (P-12)
- Curriculum and Instruction
- PostsecondaryEducation
- Special and Counselor Education


## Comprehensive Examination

The comprehensive examination covers the leadership core and is taken when the student has completed the first year of the leadership core (ED 620, ED 630, ED 640, and ED 650). The comprehensive examination is designed to as sess a student's ability to analyze, synthesize, and apply frameworks from the leadership core to an educational topic of significance. Students write an academic paper for the examination. The paper is evaluated by a faculty committee. Specializations may require that the student present and defend the paper to a faculty committee in a public meeting.

## Dissertation

The doctoral dis sertation represents original and independent inquiry that is a contribution to knowledgeor is of value foreducational practice. Students may elect to employ one of several different approved inquiry strategies, including-but not limited to-traditional research designs and methods, ethnographic and descriptive case studies, policy analy ses, product development and field testing, and programevaluation. A minimum of 18 credits is directed toward the dis sertation project.

## Residency

As is required for all doctoral degrees at PSU, candidates for the Ed.D. degree fulfill the residency require mentafter admis sion to the doctoral program. Residency can be satisfied in one of the two following ways:

- Three terms of full-time enrollment (minimum 9 graduate credits applicable to the degree programeach term) during the first two years after admis sion to the programin coursework, the study of practice (i.e., field-based work), credits by arrangement, and/or dissertation credits. This may include summer term.
- Six terms of part-time enrollment (minimum 1 graduate credit applicable to the degree programeach term) during the first two years after admis sion to the programin coursework, the study of practice (i.e., field-based work), credits by arrangement, and/or dissertation credits. This may include one or more summerterm.


## Graduate Certificates

## GRADUATE CERTIFICATE IN APPLIED BEHAVIOR ANALYSIS

A 32-credit graduate certificate in Applied Behavior Analysis (ABA) offers a concentration of coursework in behavior analysis for those interested in pursuing advanced studies in ABA. Each course in the sequence builds on each other, enhancing students' knowledge and skills in implementing evidence-based behavior support strategies. Further, for those pursuing a BCBA®, the Association for Behavior Analysis International (ABAI) has verified our7course sequence toward the coursework requirements for eligibility to take the Board Certified Behavior Analy st ${ }^{\circledR}$ examination. Applicants will need to meet additional requirements before they can be deemed eligible to take the examination. Please refer to
the $\mathrm{BACB} ®$ (bacb.com) for additional requirements.

## REQUIRED COURSES:

SpEd 558 Concepts and Principles of Applied Behavior Analysis

| SpEd 559 | Assessing Behavior | 5 |
| :--- | :--- | :--- |
| SpEd 561 | PBS: Behavior-Change <br> Strategies | 5 |
| SpEd 562 | Ethical Issues in Applied <br> Behavior Analysis | 5 |
| SpEd 565 | Single-Subject Research Design <br> in Applied Behavior Analysis | 5 |
| SpEd 566 | Advanced Research Methods in | 4 |
| SpEd 567 | ABA <br> ABA Leadership Capstone | 3 |

Total Credit Hours: 32

The graduate certificate in Infant/Toddler Mental Health: A Relationship-Based A pproach is designed for profes sionals who are working with families who have children from the prenatal period to 36 months of age. This programis appropriate for professionals who are mental health, special education, child welfare, and social service providers; home visitors; teachers; childcare providers; and health care professionals. It is also appropriate for supervis ors of thesedirect-service providers.

## DEGREE REQUIREMENTS

## INFANT TODDLER MENTAL HEALTH CERTIFICATE

## Programof Study

| ECED 585 | Dynamic Models of <br> Infant/Toddler Development | 3 |
| :--- | :--- | ---: |
| Coun 597 | Strengths, Risk Factors, and <br> Disturbance in Infants, Toddlers, <br> and Their Families | 3 |
| SpEd 594 | Assessment Methods and <br> Classification in Infant Mental | 3 |
| SpEd 595 | Health <br> Prevention and Intervention in | 3 |
| Coun 507 | Infant Mental Health <br> Professional Developmentin <br> Infant Mental Health <br> Collaborative Partnerships to <br> Support Infants and Toddlers | 5 |
| Coun 520 | Sup |  |

Subtotal: 20
Subtotal: 20
Total CreditHours: 20

## ORIENTATION AND MOBILITY FOR CHILDREN, YOUTH, AND ADULTS

The Orientation and Mobility Graduate Certificate is a 34 credit programthat is designed to be stackable with the SpecialEducation Master's Degree (p. 142).
*There are options for applicants who are Teachers of Students with Visual Impairments to have up to 9 credits of recent graduate courses applied for a 25 credit pathway to add the O\&M certificate. Appropriate application forms, transcripts, and syllabi are required.

## REQUIREMENTS

| SpEd 540 | Foundations of Education for the <br> Visually Impaired Learner | 3 |
| :--- | :--- | :--- |
| SpEd 541 | Implications of Vision Problems <br> of Children/Youth <br> Introductionto Orientation and <br> Mobility and Independent Living <br> Skills | 3 |
| SpEd 549 | Orientation and Mobility | 3 |
| SpEd 550 | Methods <br> Orientation and Mobility | 3 |
| SpEd 551 | Assessment and Instruction - <br> Children | Orientation and Mobility |
| SpEd 552 | Assessment and Instruction - <br> Adults | 3 |
| Orientation and Mobility <br> Advanced Techniques <br> 12 credits of SpEd 554 <br> Orientation and Mobility <br> Practicum | 4 |  |

Students complete 12 credits of Orientation and Mobility (O\&M) practicum which is equal to 400 hours of clinical O\&M experience that align with ACVREP requirements. O\&M practicumcredits are variable and may be taken in 3-12 credit increments across multiple terms depending upon the practicumplacementhours and the availability of a supervising Certified Orientation and Mobility Specialist (COMS). The O\&M ProgramCoordinator works with students to arrange practicumplacements based on geography, student interests, and availability of clinical partners within educational, rehabilitation and community settings. Students are eligible to sit for the certifying exam for Orientation and Mobility Specialists within 6 months of completing of coursework. A person may be certified after passing the nationalexam, submitting documentation of course work completion, and with a signed documentation from the ProgramCoordinator.
Total CreditHours: 34
SERVICE-LEARNING AND COMMUNITY BASED LEARNING IN POSTSECONDARY EDUCATION CERTIFICATE

Gain high impact knowledge, skills, and strategies for how to teach, coordinate, lead, and assess forms of servicelearning, community engagement, and community-based research in order to realize educational improvement and enhancement across diverse individuals and cultural communities ( 18 credits).

## REQUIRED COURSES

| Program of Study (12 credits) |  |  |
| :---: | :---: | :---: |
| ELP 542 | Introduction to Service-Learning: Theoretical \& Pedagogical | 4 |
|  | Perspectives in Postsecondary Education |  |
| ELP 543 | Service-Learning \& Community Based Learning in Postsecondary Educational Leadership \& Policy Dom | 4 |
| ELP 522 | Teaching Diverse Adult Learners or | 4 |
| ELP 536 | Postsecondary Curriculum or | 4 |
| ELP 528 | Leadership in Postsecondary Education | 4 |
| Culminating Experience (2 credits) |  |  |
| ELP 506 | Culminating Project | 2 |
|  | or |  |
| ELP 509 | Culminating Practicum | 2 |

Elective Courses (choose one) (4 credits)
Any ELP course 511-599 can count as an elective. Refer to the ELP Course Planning Guide for current offerings and deliveryformats (online, hybrid, F2F).

Subtotal: 18
Total CreditHours: 18
STUDENT AFFAIRS IN HIGHER EDUCATION
CERTIFICATE CERTIFICATE

Provides professional development for individuals in student affairs and student services positions in two and four-year colleges ( 18 credits).

## REQUIRED COURSES

| Programof | Study (12 credits) |  |
| :---: | :--- | :---: |
| ELP 525 | Student Services in Higher <br> Education | 4 |
| ELP 526 | Facilitating Student Success in | 4 |
| ELP 527 | Postsecondary Education <br> Legal Is sues in Higher Education | 4 |
| Culminating Experience (2 credits) |  |  |
| ELP 506 | Culminating Project <br> or | 2 |

## Programof Study ( 12 credits)

ELP 525 StudentServices in Higher

ELP 509
Culminating Practicum
Elective Courses (choose one) (4 credits)
Any ELP course 511-599 can count as an elective. Refer to the ELP Course Planning Guide for currentofferings and deliveryformats (online, hybrid, F2F).

Subtotal: 18
Total Credit Hours: 18

## SUSTAINABLE FOOD SYSTEMS GRADUATE CERTIFICATE

The Food Sy stems certificate utilizes a "Certificate Outcomes" approach, an innovative curriculummodelthat maps courses against 6 learning outcomes for the program. The learning outcomes and thecourses that meet each outcome are listed below.
The certificate will be awarded at a minimum of 18 credits depending on the courses chosen and their respective credit hours. Students may count only one outcome per course, therefore requiring a minimum of 6 courses. In addition to the courses listed below, matriculated students have the option to combine other programrequirements such as 504 / 506 / 509 courses or a community-based learning experience to satisfy Learning Outcome 3 for up to 6 credits. An independent study may also be pursued with approval fromthe programdirector or other designated faculty.

## LEARNING OUTCOMES AND CORRESPONDING COURSES

Outcome 1: Theoretical Frameworks/Ways of Knowing
Identify multiple frameworks and ways of knowing: Students will describe the complexand broad range of theories and perspectives, including non-Western epistemologies/traditions/ways of knowing, thatexist in the sustainable food systems movement.
Geog 549 Geography of Food 4
GSCM Craft Beverage Operations 4
532/GSCM Management
532S
Hst $592 \quad$ Research in World History: 4
PHE $510 \quad$ Stres s, Food, \& Health 4
PHE 522 Health and Social Inequalities 3

## Outcome 2: Power and Privilege

Explain systems of power and privilege in food systems: Students will give examples of how power and privilege affect the contemporary food system.

| ELP 548 | Global Political Ecology | 4 |
| :--- | :--- | :--- |
| Geog 549 | Geography of Food | 4 |
| Hst 592 | Research in World History: | 4 |
|  | World of Commodities |  |
| PHE 522 | Health and Social Inequalities | 3 |
| Soc 510 | Food, Justice, and Social | 4 |
|  | Movements |  |
| Soc 579 | Food, Justice, and Social | 4 |
|  | Movements |  |
| USP 568 | Oregon Land Use Law | 3 |
| USP 576 | Feeding the City | 4 |

Outcome 3: Community and/or Field-based Learning
Engage in learning in a community based setting:
Students will demons trate knowledge of food systems through a community or field-based experiential learning opportunity. This outcome can be achieved through a relevant course on our course list or through an individual internship (you may only count one internship towards the certificate).
ELP 510

> Permaculture and Whole Systems Design
> Urban Farm Education: Leveraging Policy and Research to Cultivate Garden-Based Education in Practice

ELP 540

## Independent study or internship.

Students must get faculty approval and register for USP 504, PHE 504, ELP 506, PA 509, or other relevant course, to count the field experience toward the certificate.
Outcome 4: Interdisciplinary Linkages
Examine the interdisciplinary andcross-sector nature of contemporary food systems: Students will critically examine the interconnected social, political, economic, and ecological components that influence food systems.

| ELP 540 | Urban Farm Education: <br> Leveraging Policy and Research <br> to Cultivate Garden-Based | 4 |
| :--- | :--- | :--- |
| ELP 548 | Education in Practice |  |$\quad$| Global Political Ecology |
| :--- |

## Outcome 5:Strategies

Evaluate strategies to address food system challenges:
Students will critically examine strategies to address food systemchallenges.

| ELP 510 | Permaculture and Whole <br> Systems Design | 4 |
| :--- | :--- | :--- |
| ESM 527 | Watershed Biogeochemistry | 4 |
| GSCM | Craft Beverage Operations | 4 |
| 532/GSCM | Management |  |
| 532 |  |  |
| PA 574 | Food and Agriculture Policy | 3 |
| PHE 527 | Food Systems and Public Health | 3 |
| Soc 510 | Food, Justice, and Social | 4 |
| SySc 513 | Movements |  |
| Holistic Strategies for Problem | 4 |  |
| USP 542 | Solving <br> USP 576 | Land Use Implementation |
|  | Feeding the City | 3 |
|  |  | 4 |

## Outcome 6: Elective

Student will select a relevant course for their own learning and professional goals, and to enable specialization. Can be another certificate class, an independentstudy, an individual internship (though note that you may only count one internship towards thecertificate), or a course from the list below:

| PA 525 | Grantwriting forNonprofit | 3 |
| :--- | :--- | :--- |
| PHE 517 | Organizations |  |
| Community Organizing | 3 |  |

Other ideas? Obtain email confirmation fromCertificate Director prior to enrolling.
Total Credit Hours: 18

## TEACHING ADULT LEARNERS CERTIFICATE

Focuses on the teaching and motivation of diverse adult learners and the most effective strategies to ensure learning and professional development ( 18 credits).

## REQUIRED COURSES

| Program of Study (12 Credits) |  |  |
| :---: | :---: | :---: |
| ELP 520 | Developmental Perspectives on | 4 |
|  | Adult Learning |  |
| ELP 521 | Adult Learning and Motivation | 4 |
| ELP 522 | Teaching Diverse Adult Learners | 4 |
| Culminating Experience (2 credits) |  |  |
| ELP 506 | Culminating Project | 2 |
|  | or |  |
| ELP 509 | Culminating Practicum | 2 |

## Hective Courses (choose one) (4 credits)

Any ELP course 511-599 can countas an elective. Refer to the ELP Course Planning Guide for currentofferings and deliveryformats ( online, hybrid, F2F).
Subtotal: 18

## Total Credit Hours: 18

## TRAINING \& DEVELOPMENT CERTIFICATE

Provides experiential preparation and professional development in training and development for those who develop, teach/train, manage, and/or consult utilizing multiple delivery models. Based on the Association for Talent Development (formerly ASTD, American Association for Training \& Development) national competencies ( 18 credits).

## REQUIRED COURSES

| Required Courses (6 to 7 credits) |  |  |
| :---: | :---: | :---: |
| ELP 529 | Principles of Training and Development | 3 |
| ELP 530 | Course Design andEvaluation or | 4 |
| ELP 584 | Strategies for eLearning | 3 |
| Specialization Courses |  |  |
| Training (6 credits) |  |  |
| ELP 532 | Training Methods | 3 |
| ELP 539 | Developing Training Materials | 3 |
| Culminating Experience ( 2 credits) |  |  |
| ELP 506 | Culminating Project | 2 |
| ELP 509 | Practicum | 2 |

## Recommended Eective Courses ( $\mathbf{2} \mathbf{- 4}$ credits)

Any ELP course 511 -ELP 599 can count as an elective. Refer to the ELP Course Planning Guide for current offerings and delivery formats (online, hybrid, F2F). Subtotal: 18
Total Credit Hours: 18

## Licensure

In Oregon, educator candidates become eligible for a state educator license by completing coursework, student teaching and assessments, used to determine their status as programcompleters. Once all criteria are met, candidates can then be recommended to Teacher Standards and Practices Commission (TPSC) for an educator license. Assessments during a programinclude subject matter test(s), a civil rights knowledge test, and a nationally-scored assessment, edTPA. For information on Oregon testing requirements please refer to the Teacher Standards and Practices Commission website.

Tools of multiple measure are available to programs to assistcandidates for whom tests or assessments present a barrier to programcompletion. Each licensure programin the COE has processes for utilizing the multiple measures tools which were developed by TSPC.

## GRADUATE TEACHER EDUCATION PROGRAMS

The College of Education offers two licensure programs, one in elementary and one in secondary, that also include a Master's degree. This program is designed forstudents who wish to teach in public schools and is available in oneyear and two-year formats. Successful completion of these programs culminates in a recommendation to Oregon's Teacher Standards and Practices Commission for a teaching license. Specific programadmis sion requirements and application details are available at $w w w . p d x . e d u / c i / g t e p-i n f o$.

The M.Ed. is earned by students who have completed PSU's Graduate Teacher Education Program(GTEP),and Secondary Dual Educator Program(SDEP). Graduate level students in the Bilingual Teacher Pathway (BTP) Program may earn the M.Ed. with the completion of ITP 551 Research and ClassroomInquiry.

## PROGRAM REQUIREMENTS

| GTEP Eementary |  |  |
| :---: | :---: | :---: |
| Ed 518 | Inclusive Elementary | 2 |
|  | Classrooms |  |
| ITP 514 | Educating for Equity and Social | 3 |
|  | Justice |  |
| ITP 534 | Foundations of Culturally and | 2 |
|  | Linguistically Responsive |  |
|  | Practice at the Elementary Level |  |
| ITP 535 | Cultivating Responsive | 1 |
|  | Elementary Classrooms |  |
| ITP 536 | Learning and Development | 3 |
| ITP 537 | Instructional Design and | 1-3 |
|  | Assessment |  |
| ITP 538 | Integrated Methods | 4 |
| ITP 539 | Elementary Mathematics | 1-4 |
|  | Methods |  |
| ITP 540 | Foundations of Literacy | 4 |
| ITP 541 | Literacies in the Elementary | 4 |
|  | Classroom |  |
| ITP 542 | Integrated Elementary Science | 2 |
|  | Methods |  |
| ITP 543 | Professional Collaboration in | 1-3 |
|  | Elementary Education |  |


| ITP 545 or | StudentTeaching I | $3^{*}$ |
| :--- | :--- | ---: |
| 548 |  | $6^{*}$ |
| ITP 546 or | StudentTeaching II | $12^{*}$ |
| ITP 547 or <br> 550 | StudentTeaching III |  |

Subtotal: 45-66
*required for licensure but may not be applied toM.Ed.
8 credits of ITP 537, 4 credits of ITP 539, 6 credits of ITP 543 , and 3 credits of ITP 535 are required for the degree.
Total 66 credits forlicense
Total45 credits forM.Ed.

| GTEP Secondary |  |  |
| :---: | :---: | :---: |
| ITP 509 | Practicum | 3 |
| ITP 511 | ClassroomManagement for StudentSuccess | 3 |
| ITP 512 | Learning and the Learner | 3 |
| ITP 513 | Technology as a Tool for Learning | 3 |
| ITP 514 | Educating for Equity and Social Justice | 3 |
| ITP 515 | Foundations of Culturally and <br> Linguistically Responsive <br> Practice at the Secondary Level | 3 |
| ITP 516 | Engaging Young Adolescent Learners or | 3 |
| ITP 517 | Engaging Adolescent Learners | 3 |
| ITP 518 | Assessment forLearning | 2 |
| ITP 520 | Literacies in the Disciplines | 3 |
| $\begin{aligned} & \text { ITP 521- } \\ & 528 \end{aligned}$ | Secondary Methods | 10 |
| ITP 529 | Professional Seminar-Secondary | 1 |
| ITP 530 or | StudentTeaching I | 8* |
| ITP 531 or 533 | Student Teaching II | 13* |
| ITP 551 | Research and Clas sroomInquiry | 1-4 |
| Ed 519 | Inclusive Secondary Classrooms | 3 |

Subtotal: 45-66
*required for licensure but may not be applied to M.Ed.
Total 66 credits for license
Total45 credits forM.Ed.
Secondary education at Portland State University is available in the following endorsement areas: art, biology, chemistry, world languages, health education, integrated science, language arts, mathematics, music, physical education, physics, and social studies. Initial subject matter
endorsement requirements are outlined in the appropriate department section of this catalog.

## MATHEMATICS INSTRUCTIONAL LEADER: PREK-8 SPECIALIZATION

The Mathematical Instructional Leader: Pre-K Specialization Programin the College of Education consists of graduate mathematics content, pedagogy, and leadership courses and a practicumspecifically designed for teachers, teacher leaders, and coaches. The goals of the programare to offer a comprehensive mathematics education experience that:
-
Deepens mathematical content knowledge including the specialized knowledge needed for teaching mathematics and the development of mathematical ideas across the grades.
-
Attends to both content and pedagogy and the ways that teaching supports each and every student's deep understanding of mathematics.
-
Develops expertise in using and helping others use equitable and effective instructional practices centered on students' mathematical thinking.
-
Increases ability to engage as a leader to supportschool and district efforts that help all students learn important mathematics.

## REQUIREMENTS

| Mathematics Content-Focused Methods Courses |  |  |
| :--- | :--- | :--- |
| (choose five of the seven) |  |  |
| CI 511 | Examining Base Ten Numeration <br> and Operations | 3 |
| CI 512 | Examining Operations with <br> Whole Numbers and Fractions | 3 |
| CI 513 | Enhancing Algebraic Thinking: <br> Generalization about Operations | 3 |
| CI 514 | Enhancing Algebraic Thinking: <br> CI 515 | Patterns and Functions <br> Developing Geometric Thinking <br> and Concepts |
| CI 516 | Exploring Meas urement | 3 |
| CI 517 | Concepts <br> Developing Concepts of Data <br> Analysis | 3 |

## Advanced Mathematics Methods Course

| CI 518 | Mathematics Teacher <br> Leadership: Implementing <br> Effective and Equitable <br> Mathematics Teaching Practices |
| :--- | :--- |
| Mation |  |

If desired, the graduate credit received can be applied toward an M.A., M.S., or Ed.D. in the Department of Curriculum and Instruction within the College of Education.

For more information see: www.pdx.edu/ci/deepeningmath

## MATHEMATICS INSTRUCTIONAL LEADER GRADES 6-12 SPECIALIZATION

The Mathematical Instructional Leader: Grades 6-12 Specialization Programin the College of Education cons ists of graduate mathematics content, pedagogy, and leadership courses and a practicum specifically designed for teachers, teacher leaders, and coaches. The goals of the programare to offer a comprehensive mathematics education experience that:

Deepens mathematicalcontent knowledge including the specialized knowledge needed for teaching mathematics and the development of mathematical ideas across the grades.

Attends to both content and pedagogy and the ways that teaching supports each and every student's deep understanding of mathematics.
-
Develops expertise in using and helping others use equitable and effective instructional practices centered on students' mathematical thinking.
-
Increases ability to engage as a leader to supportschool and district efforts that help all Grades 6-12 students learn important mathematics.

## DEGREE REQUIREMENTS

## Mathematics Content-Focused Methods Courses

(Choose 3 or more courses based on diag nostic as sessment)

| CI 540 | Modeling with and Using <br> Representations in Mathematics | 3 |
| :---: | :--- | :---: |
| CI 541 514 | Reasoning and Proving Across <br> Mathematics | 3 |
| CI 515 | Enhancing Algebraic Thinking: <br> Patterns and Functions <br> Developing Geometric Thinking <br> and Concepts | 3 |
| CI 516 | Exploring Meas urement <br> Concepts | 3 |
| CI 518 | Mathematics Methods Course <br> Mathematics Teacher <br> Leadership: Implementing | 3 |
|  | Effective and Equitable <br> Mathematics Teaching Practices | 3 |

Educators seeking the 12-credit Certification of
Completion in Deepening Understanding Mathematics Teaching and Learning complete three Mathematics Content-Focus Methods Courses and CI 518 Implementing Mathematics Reform. Those seeking the 18-credit
Mathematics Instructional Leader: Grades 6-12
Specialization also complete CI 519 and CI 521.
Mathematics LeadershipFocused Courses
CI 519 Mathematics Teacher
Leadership: Supporting Collegial
Learning and School
Improvement
CI 521 Mathematics Teacher
Leadership: Res ponsive
Mathematics Instruction and
Assessment

Upon completion of the Grades 6-12 Specialization coursework, programcompleters are eligible for recommendation to TSPC to add the specialization to their license. Per TSPC, "A specialization is distinguished from an endorsement in that a specialization is not required to teach or work in the specialized area, whereas an endorsement is required to work in the subject-matter area."

If desired, the graduatecredit received can be applied toward an M.A., M.S., or Ed.D. in the Department of Curriculum \& Instruction within the College of Education.
For more information see:
http://www.pdx.edu/ci/deepening-math
INCLUSIVE ELEMENTARY EDUCATOR PROGRAM (IEEP)

## with Master's Degree

The College of Education offers a dual licens ure program in early childhood and elementary general and special education that also includes a master's degree. This fulltime programof integrated coursework and field experiences is completed over sixterms. Students are licensed to teachearly childhood and elementary (pre-K to grade 8 ) and special education. Faculty fromboth curriculumand instruction and specialeducation departments are instructors in this program. This program reflects the rapidly changing nature of America's schools, where a wide range of diverse learners can be found in mostclassrooms.

## REQUIREMENTS

| Courses |  |  |
| :--- | :--- | ---: |
| SpEd 537 |  <br> Instruction (Elementary) | 4 |
| ITP 535 | Cultivating Responsive <br> Elementary Clas srooms | 1 |
| ITP 509 | Initial Field Experience | 1 |
| Ed 530 | Introductionto Inclusion and | 2 |
|  | SpecialEducation <br> ITP 512 | Learning and the Learner |
| SpEd 509 | Practicum <br> Ed 534 | Literacy Methods for the |
| SpEd 548 | Inclusive Clas sroom <br> Positive Behavior Support in the | 3 |
| ITP 539 | Classroom <br> Elementary Mathematics <br> Ed 535 | Methods <br> ClassroomBased Assessment for |
| SpEd 532 | the Inclusive Educator <br> Inclusive Practices | $1-4$ |
|  | 2 |  |


| SpEd 509 | Practicum | 1-9 |
| :---: | :---: | :---: |
| ITP 514 | Educating for Equity and Social Justice | 3 |
| ITP 542 | Integrated Elementary Science Methods | 2 |
| ITP 538 | Integrated Methods | 4 |
| $\begin{aligned} & \text { ITP } 546 \text { or } \\ & 549 \end{aligned}$ | Student Teaching II | 6* |
| SpEd 536 | Specialized Techniques | 3 |
| Ed 537 | Professional Seminar I: Law and Ethics | 1 |
| $\begin{aligned} & \text { ITP } 547 \text { or } \\ & 550 \end{aligned}$ | Student Teaching III | 12* |
| ITP 509 | Initial Field Experience | 1 |
| SpEd 512 | Diagnostic Assessment | 4 |
| SpEd 509 | PracticumSpecialEd | 2 |
| SpEd 525 | StudentTeaching | 6 |
| SpEd 522 | Comprehensive Individualized Assessment and Curriculum 1 | 3 |
| SpEd 523 | Comprehensive Individualized Assessmentand CurriculumII | 3 |
| Ed 542 | Collaboration for the Inclusive Elementary Educator | 2 |
| Ed 539 | Profes sional Seminar III: Reflection and Job Search | 1 |
| SpEd 506 | SpecialProblems | 1-6 |

Subtotal: 95

## SECONDARY DUAL EDUCATOR PROGRAM (SDEP)

The College of Education offers a dual licensure program in a content area (e.g. math, social studies, English, science, etc.) and special education that also includes a master's degree. This full-time programof integrated coursework and field experiences is completed oversix terms plus one summer. Students als oreceive additional instruction in supporting English language learners. Faculty fromboth the Curriculumand Instruction and the Special Education departments teach in the program. The programreflects the rapidly changing needs of America's schools where a wide range of diverse learners are found in each classroom.

## REQUIREMENTS

## Courses

CI 543 Effective Tchg Strategies \& Materials for Working with Linguistically \& Culturally Diverse Stdnts
Ed 507 Seminar I: Student Teaching 1
Ed 581 Inclusive Clas sroomResearcher 2
Ed $583 \quad$ Study Skills and Learning 2

| Ed 585 | Instructional Planning for | 3 |
| :---: | :---: | :---: |
|  | Inclusive Clas srooms |  |
| Ed 586 | Collaborative Teaching | 2 |
| Ed 587 | Inclusive Educational Research and Leadership | 2 |
| ITP 511 | ClassroomManagement for StudentSuccess | 2 |
| ITP 512 | Learning and the Learner | 3 |
| ITP 514 | Educating for Equity and Social Justice | 3 |
| ITP 521-528 | Secondary Methods | 10 |
| ITP 521-528 | Secondary Methods | 8 |
| SpEd 513 | ClassroomBased Assessment and InstructionalPlanning | 3 |
| SpEd 548 | Positive Behavior Support in the Classroom | 3 |
| SpEd 528 | Instructional Methods I: Literacy | 3 |
| SpEd 529 | Instructional Methods II: Math and Content | 3 |
| SpEd 571 | Adolescents with Learning Differences | 2 |
| Ed 509 | Initial Field Experience | 3 |
| Ed 582 | Collaborative Teaming and the SpecialEducation Process | 4 |
| Ed 584 | Advocacy and Transition Planning | 2 |
| ITP 580 | StudentTeaching I in Inclusive ML/HS | 6 |
| ITP 581 | Student Teaching II in Inclusive ML/HS | 12 |
| SpEd 509 | Prac I: Supervised Field Experience | 3 |
| SpEd 509 | Prac II: SupervisedField Experience | 3 |
| SpEd 512 | Diagnostic Assessment | 3 |
| SpEd 522 | Comprehensive Individualized Assessment and Curriculum 1 | 3 |
| SpEd 523 | Comprehensive Individualized Assessmentand Curriculum II | 3 |
| SpEd 525 | StudentTeaching | 6 |
| SpEd 536 | Specialized Techniques | 3 |
| SpEd 577 | Interagency Collaboration | 2 |

Subtotal: 98
8 credits total in Secondary Methods courses ITP 521, ITP
522, ITP 523, ITP 524, ITP 525, ITP 526, ITP 527, and ITP 528 from your content area required.

## INTERNATIONAL TEACHER EDUCATION PROGRAM

The College of Education offers an International Teacher Education Programfor students whohold teaching licenses in other countries and who are seeking Oregon teaching licenses. It is designed to meet the Initial Teaching

Licensure requirements set forth by Oregon's Teacher Standards and Practices Commis sion. Through an individualized planned program, students fulfill all of the requirements stated above for the Graduate Teacher Education Programthrough either equivalency, substitution, or current coursework/classroomexperiences. A 6-credit student teaching experience is required, along with a minimum of 17 credits of course work taken at PSU. Candidates will need to pass a state required performance as sessment. For admis sions procedures, testing requirements, and an appointment with programfaculty, please call the COE at 503-725-4619.

## BILINGUAL TEACHER PATHWAY (BTP) PROGRAM

The College of Education offers a preparation programfor bilingual/bicultural individuals who are employees in partner school districts or bilingual/bicultural individuals seeking initial teacher licensure at the elementary level.
The BTP core consists of 38 credits and 13 credits of field experience. In addition, the Dual-Language specialization of 18 credit hours is integrated into the programplan of study. Required prerequisiteclasses should be completed prior to admis sion into the BTP program. Students may apply at the undergraduate ( 120 credits/senior status) or graduate level. BTP is a part-time programoffering evening and weekend clas ses. For more information please see the BTP site at pdx.edu/education/btp.

## REQUIREMENTS

| Early Childhood and Elementary Education |  |  |
| :---: | :---: | :---: |
| BBE 422- | Human Development \& Learning | 4 |
| 522 | in Multicultural/Multilingual Communities |  |
| BBE 424- | Professional Development and | 2 |
| 524 | Reflection |  |
| BBE 432- | Language and Literacy | 3 |
| 532 | Developmentof Diverse Learners |  |
| BBE 434- | Planning, Assessment, and | 3 |
| 534 | Curriculum |  |
| BBE 442- | Elementary Mathematics | 3 |
| 542 | Methods for Dual Language Learners |  |
| BBE 444- | Culturally Responsive Learning | 3 |
| 544 | Environments |  |
| BBE 448- | Biliteracy Development for Dual | 3 |
| 548 | Language Learners |  |
| BBE 452- | Integrating Arts in Elementary | 3 |
| 552 | Methods |  |
| BBE 454- | Technology andEducation | 3 |
| 554 |  |  |
| BBE 462- | Science Methods for Elementary | 3 |
| 562 | Dual-Language Learners |  |


| BBE 472- | Literacy Development in the | 3 |
| :---: | :---: | :---: |
| 572 | Content Area |  |
| BBE 474- | Biliteracy Assessment | 3 |
| 574 |  |  |
| BBE 480- | Inquiry and Reflective | 8 |
| 580 | Practitioner |  |
| CI 443/543 | Effective Strategies for Language Minority Students | 3 |
| CI 496/596 | Second Language Acquisition \& Development for K-12 Educators | 3 |
| ELP | ELL SchoolCommunity | 3 |
| 465/565 | Relations |  |
| ELP | Impact of Language and Culture | 3 |
| 466/566 |  |  |
| ITP 545 or | Student Teaching I | 4* |
| 548 |  |  |
| ITP 546 or | Student Teaching II | 9* |
| 549 |  |  |

*required for licensure but may not be applied toward the M.Ed.

Total 56 credits for M.Ed
Total 69 credits forlicensure

## READOREGON

The ReadOreg on programis a PSU-based, fully online programthat serves the entire state of Oregon, and offers:

- Reading Specialist Endorsement Program—graduatelevel, online, 24-credit reading specialist endorsement program.
- Literacy Education Course of Study-graduate-level, online, 12 -credit literacy education certificate of completion for general classroomteachers.
The goal of both options is to help pre-service and inservice teachers become stronger teachers of literacy and to help teachers develop skills in literacy leadership.
ReadOregon courses were designed to be used toward a reading specialist endorsement, a concentration in a master's degree program, and/or a component of profes sional development in the area of literacy.

For more information aboutPortland State University's ReadOregon courses and admission, vis it http://www.pdx.edu/ci/ReadOregon.

## ESOL ENDORSEMENT

The College of Education offers a programleading to an ESOL endorsementfor teachers already holding a valid Oregon teaching license. The programis as follows:

## REQUIREMENTS

| Courses |  |  |
| :---: | :---: | :---: |
| CI 443/543 | Effective Tchg Strategies \& | 3 |
|  | Materials for Working with |  |
|  | Linguistically \& Culturally |  |
|  | Diverse Stdnts |  |
| CI 496/596 | Second Language Acquisition and Development for K-12 | 3 |
|  | Educators |  |
| CI 497/597 | Assessment of Language and | 2 |
|  | Content Learning for K-12 |  |
|  | English Learners |  |
| ELP | ELL SchoolCommunity | 3 |
| 465/565 | Relations |  |
| ELP | Impact of Language and Culture | 3 |
| 466/566 |  |  |
| ELP | ESL/Bilingual Program Designs | 3 |
| 467/567 | and Models |  |
| SPED | Working with LEP Children who | 2 |
| 455/555 | Have Special Needs |  |
| CI 509 | Practicum: ESOL-Bilingual | 3 |
|  | Endorsement |  |

Subtotal: 22

## EDUCATIONAL ADMINISTRATION

Two authorized programs comprise the Executive Leadership Programleading to institutional recommendations for principal and professional adminis trator licens ure of programcompleters for positions as building and district level adminis trators. All students are required to have an approved programof study, as described below, filed with the College of Education. Admis sion requirements and detailed program information for each programare available from the Department of Educational Leadership and Policy (ELP).

## PRINCIPAL LICENSE PROGRAM

This programprepares individuals for positions as building-leveladministrators. This license requires completion of a master's degree and three years of academic years of experience as a full-time licensed educator. The licensure programmay be completed either as part of a master's degree in educational administration or subsequent to the completion of a master's or higher degree in the arts and sciences or an advanced degree in the professions froma regionally accredited institution in the United States, or the foreign equivalent of such degree, together with an equally accredited bachelor's degree. The principal license curriculumincludes:

## Courses

## Prerequisites:

ELP 506
Special Problems 1-6

## Core:

| ELP 569 | PrincipalLeadership: |
| :---: | :--- |
|  | Introductionto Educational |
| ELP 570 | Administration |
|  | PrincipalLeadership:Human |
|  | Relations and Educational |
| Foundations |  |
| ELP 571 | PrincipalLeadership:Teaching, <br>  <br> ELP 572 <br>  <br>  <br>  <br> Learning and Curriculum <br> PrincipalLeadership:Human <br> Resource Development and <br> OrganizationalChange <br> ELP 573 574 <br> ELP PrincipalLeadership:Project I <br> ELP 575 <br> ELP 509 <br> Principal Leadership:Project II <br> Subtotal:40 |
| Administrative Practicum |  |

## PROFESSIONAL ADM INISTRATOR LICENSE PROGRAM

This programprepares individuals for positions as continuing school administrators and as school district administrators. This programrequires prior completion of the Principal License programor its equivalent, and three
(3) years of one-half time or more experience on any administrator license appropriate for the assignment in a public or accredited private school setting.

| Courses |  |  |
| :---: | :---: | :---: |
| ELP 576 | District Leadership: Instructional | 4 |
|  | Equity |  |
| ELP 577 | District Leadership:Professional | 4 |
|  | Capacity and Engagement of |  |
|  | Staff and Community |  |
| ELP 578 | District Leadership: Mission, | 4 |
|  | Vision, and Values of Ethics and |  |
|  | Equity |  |
| ELP 579 | District Leadership: Continuous | 4 |
|  | Improvement, Operations and |  |
|  | Management |  |
| ELP 580 | District Leadership: Equity, | 3 |
|  | Instruction and Care for Students |  |
| ELP 581 | District Leadership: Ethical | 3 |
|  | Management and Levers for |  |
|  | Improvement |  |
| ELP 506 | CAL-Special Problems | 4 |
| Subtotal:27 |  |  |
| Students who completed an earlier licensure programprior to 2007 should consult with the Department of Educational Leadership and Policy (ELP) to determine what new license requirements must be met. |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

LITERACY EDUCATION/READING ENDORSEMENT

The COE on-campus literacy programoffers face-to-face and hybrid courses designed to help preservice and inservice teachers become stronger teachers of literacy and to help teachers develop literacy leadership skills.
Students in the Literacy Education Program will:

- Develop a theoretically-grounded, research-based, multi-faceted view of reading, writing, speaking, and listening with a focus on meaning making.
- Examine the roles of and language in literacy development, assessment, and instruction.
- Evaluate the strengths and limitations of as sessment tools and assessment plans.
- Use a constellation of as sessments to identify students' complex patterns of literacy strengths and needs.
- Design targeted, culturally-responsive instruction.
- Plan family literacy outreach and facilitate literacy professional development experiences for colleagues.
- Master the International Literacy Association standards for reading specialists and literacy coaches.On-
Campus program options include:
- A 25-credit reading endorsement program
- A 12-credit certificate of completion


## Endorsement

The PSU reading endorsement programis a 25 -credit programincluding a core of 16 credits, 3 credits of practicum, and 6 credits of electives. The programis designed to prepare students for careers as Title I teachers, reading specialists, literacy coaches, consultants, and district-level reading and language arts coordinators. A reading endorsement is also useful for clas sroomte achers wishing to develop stronger knowledge about literacy and about teaching students fromdiverse linguistic and cultural backgrounds.

Completion of the following coursework, the PRAXIS Specialty Area Exam in Reading, and a 90 hour practicum are required for an Oregon Reading (Intervention) Endorsement. No 400 or 800 level courses are accepted.

## REQUIREMENTS

## Core (16 credits)

READ 522 Literacy Foundations 3
CI 528 Literacy Assessment for Reading 3 Specialists

| CI 529 | SchoolReading Program | 3 |
| :---: | :---: | :---: |
|  | Leadership |  |
| CI 536 | Language, Literacy, and Culture | 3 |
| CI 574 | Assessing and Teaching | 3 |
|  | Struggling Elementary Readers |  |
| Practicum (3 credits) |  |  |
| CI 509 | Practicum: Reading Endorsement | 1-9 |
| Electives (6 credits chosen in consultation with advisor) |  |  |
| ECED 572 | Language and Literacy in Early Childhood Education | 3 |
| CI 547 | Advanced Elementary Literacy Methods | 3 |
| CI 520 | Linguistics forTeachers | 3 |
| CI 524 | Writing W orkshop | 3 |
| READ 527 | Literature in Classrooms K-12 | 3 |
| CI 531 | Facilitating Content Area | 3 |
|  | Literacy Strategies |  |
| Lib 529 | Young Adult Literature | 3 |
| Subtotal: 25 |  |  |

## SCHOOL COUNSELING LICENSING

The SchoolCounseling specialization has threeoptions: TrackI, Track II, and Licensure-only.

## Track I \& Track II

The School Counseling specialization prepares individuals to work as counselors in school settings (P-12). Emphas is is placed on preparing school counselors to work with students to support themin the process of achieving academic, career, and personal/social success. Students who have a teaching license and two years teaching experience take 6 additional elective credits (Track I). Students who cannot document a teaching license and two years of teaching experience must complete a 6-credit, 200- hour Effective Teaching sequence to obtain licensure as a school counselor (see"Licensure (p. 140)") (Track II).

## Licensure-only

Students enrolled in the licensure-only option must be graduates froman accredited Master's programin counseling, psychology, or social work that required a clinical practicumfocused on individual and group counseling skills. Graduate degrees in teaching or education are not accepted. The programis designed to meet the requirements for the Preliminary School Counselor License approved by TSPC. Students must complete 27-33 credits in the school counseling core to be eligible for the Preliminary SchoolCounselor license.
All students in the Licensure-only option must take the SchoolCounseling specialization core courses. The

Teacher Standards and Practices Commis sion requires school counselors to have two years' experience as a licensed teacher in a public school setting. Individuals in need of the teaching requirement must take the six-credit, 200 -clock-hour teaching experience sequence.
All students (Track I, Track II, and Licensure only) are required to:

- Be fingerprinted and clear Oreg on State Police and FBI background checks.
- Complete a school counseling action research or related project and professional eportfolio documenting the knowledge, skills, and competencies required by TSPC.
- Complete a 600-clock-hour internship; internship includes placement in an early childhood/elementary and/or in a middle/high school setting.
- Have two years' teaching experience. Students without two years' teaching experience must complete a 200hour teaching experience practicumin a year-long 6credit course sequence.

Additional information about requirements and specific courses can be obtained frommembers of the Counselor Education faculty responsible for advising students in the SchoolCounseling specialization.

## SPECIAL EDUCATION LICENSURE PROGRAMS

The PSU College of Education offers licensure and endorsement programs for:
-
Persons seeking their s pecial education initial Oregon teaching license.

- Persons seeking an Oregon Preliminary Teaching License with elementary education and a special education endorsement through an integrated dual program(Inclusive Elementary Educator Program.
- 

Pers ons seeking mid-level and/or secondary education initial Oregon teaching license in a content area and a special education endorsement through an integrated dual program(Secondary Dual Education Program).
-
Teachers who hold a valid Oregon teaching license in general education and wish to add the special education endorsement.
-
Teachers who hold a valid Oregon teaching license in special education and wish to take advanced specialty coursework as part of their continuing professional development plan.
-
Persons who wish to completea Master of Arts (M.A.) or Master of Science(M.S.) degree in specialeducation.

## Dual endorsement options

The SpecialEducation programoffers a dualendorsement option in elementary education (general education licensure) and special education, referred to as the Inclusive Elementary Educators Program(IEEP). A Secondary DualEndorsement Program(SDEP) is offered in mid-level high-school education and special education. Students who complete these programs receive two endorsements and their master's degree.

## EXPERIENCE

In addition to a bachelor's degree, experience in education such as: early childhood special education, elementary or secondary teacher, ins tructional assistant, substitute teacher, or community experience is strongly recommended. Applicants without experience are encouraged to enroll in UnSt 421 or SpEd 460 Outdoor $\mathrm{Ed} /$ Recreation for a two-week summer camp experience at Mt. Hood Kiwanis Camp with students with disabilities to determine if they wish to pursue a career serving populations with special needs.
Learn more about special education programs on our web page for prospective students or attending one of our advis ing sessions.
PSU offers programs leading to state licensure and endorsements in the following areas:

- SpecialEducatorInitial License or Endorsement
- Visually Impaired Learner IntialLicense or Endorsement
- Early Intervention Special Education Intial License or Endorsement


## SPECIAL EDUCATOR INITIAL LICENSE PROGRAM

The SpecialEducator licensure programprepares teachers to work with children and youth with a range of dis abilities in elementary and secondary settings. The Special Educator licensure programis offered either as a full time (one year) or part time (two year) program.
For current prerequis ites please see:
http://www.pdx.edu/sped/prerequisites

## REQUIREMENTS

| Courses |  |
| :---: | :--- |
| SpEd 511 | Foundations of Special |
|  | Education |

SpEd 516
Classroom Assessment, Instruction, and Behavior Management (Secondary)
SpEd $514 \quad$ Legal and EthicalFoundations of SpecialEducation
SpEd 509 Profes sional Introduction to the Start of the School Year
SpEd 522 Comprehensive Individualized
Assessment and Curriculum 1
SpEd 537
SpEd 548
SpEd 530
SpEd 509
SpEd 523
SpEd 526
SpEd 512
SpEd 538
SpEd 533 Math Assessment and Instruction 3
SpEd 509 Profes sional Practices Seminar II 3
SpEd 525 StudentTeaching 12
SpEd $510 \quad$ Inclusive Practices 2
Subtotal: 64

## ADDED SPECIAL EDUCATOR ENDORSEMENT (ADDSPED)

The AddSPED endorsement programis designed especially for Oregon teachers with general education licenses at the elementary and/or middle/secondary grade levels that want to add a special education endorsement to their current non-provis ional license. AddSPED is a six term part time programoffered using a hybrid format that is designed with working teachers in mind.
For current prerequisites, please see:
http://www.pdx.edu/sped/addspedprerequisite-coursework

## REQUIREMENTS

| Courses |  |  |
| :---: | :---: | :---: |
| SpEd 514 | Legal and Ethical Foundations of SpecialEducation | 3 |
| SpEd 530 | Families and Advocacy | 3 |
| SpEd 537 | Reading Assessment \& Instruction(Elementary) | 4 |
| SpEd 509 | Professional Practices Seminar 1 | 3 |
| SpEd 548 | Positive Behavior Support in the Classroom | 3 |
| SpEd 522 | Comprehensive Individualized Assessment and Curriculum 1 | 3 |
| SpEd 512 | Diagnostic Assessment | 4 |
| SpEd 523 | Comprehensive Individualized Assessment and CurriculumII | 3 |


| SpEd 510 | Inclusive Practices | 2 |
| :--- | :--- | :--- |
| SpEd 509 | PracticumII | 3 |
| SpEd 526 | IEP and Collaborative Teaming | 4 |
| SpEd 516 | ClassroomAssessment, | 4 |

Instruction, and Behavior Management(Secondary)

Subtotal: 39

## VISUALLY IMPAIRED LEARNER INITIAL LICENSE OR ENDORSEMENT PROGRAM

The Vis ually Impaired Learner Programprovides an initial license or endorsement to work with students who have blindness or visual impairments. With an authorization of birth-21, students will achieve the competencies to deliver services in both public school and specialized school settings. The primary focus of the programis prepare candidates to teach within the expanded corecurriculum and adapt the general education curriculumto ins ure acces sibility for students.

## REQUIREMENTS

| Courses |  |  |
| :---: | :---: | :---: |
| SpEd 509 | PracticumI | 3 |
| SpEd 509 | PracticumII | 3 |
| SpEd 510 | Legal and EthicalFoundations | 3 |
| SpEd 520 | Collaboration I: Families and | 3 |
| SpEd 548 | Community - EL and EI/SE Positive BehaviorSupport in the Classroom | 3 |
| SpEd 525 | StudentTeaching | 6-15 |
| SpEd 540 | Foundations of Education for the Visually Impaired Learner | 3 |
| SpEd 541 | Implications of Vision Problems of Children/Youth | 3 |
| SpEd 542 | Assessment of the Visually Impaired | 3 |
| SpEd 543 | Reading and Literacy - Visually Impaired Learners | 3 |
| SpEd 544 | Methods of Teaching Academics: Visually Impaired Learner | 3 |
| SpEd 545 | Introduction to Orientation and Mobility and Independent Living Skills | 3 |
| SpEd 546 | Braille I | 3 |
| SpEd 547 | Braille II | 2 |
| SpEd 575 | Braille III/Technology for the Visually Impaired | 3 |
| SpEd 576 | Visually Impaired Learner with Additional Disabilities | 3 |

Adding a VIL endorsement to a non-provisional teaching license may vary by state and type of current license held but is approximately 42-50 credits.
Subtotal: 56

## EARLY INTERVENTION SPECIAL EDUCATION INITIAL LICENSE OR ENDORSEMENT PROGRAM

The Early Intervention Special Education Program is designed to prepare professionals to provideservices for infants, toddlers, and young children and their families with developmental delays, social-emotional behavioral needs, and disabilities. Representative positions include supporting children in community preschool and care settings such as Head Start and Early Head Start by providing consultation to their teachers; providing consultation and support for families in theirhomes and other community settings; providing as sessment and evaluation services; working as a cross-disciplinary team member; and providing service coordination.

Forcurrent prerequisites, for initial licenses only, please see:http://www.pdx.edu/sped/prerequisite-coursework-eise

## REQUIREMENTS

| Courses |  |  |
| :---: | :---: | :---: |
| ECED 571 | Play: Curriculum in Early | 3 |
|  | Childhood Education |  |
| SpEd 507 | Seminar: Student Teaching | 1 |
| SpEd 509 | Prac I: Supervised Field | 3 |
|  | Experience |  |
| SpEd 509 | Prac II: Supervised Field | 3 |
|  | Experience |  |
| SpEd | Inclusive Early Childhood | 3 |
| 410/510 | Models |  |
| SpEd 579 | Literacy in Early | 3 |
|  | Intervention/SpecialEducation |  |
| SpEd 520 | Collaboration I: Families and | 3 |
|  | Community - EL and EI/SE |  |
| SpEd 525 | StudentTeaching | 6-15 |
| SpEd 580 | Introduction to Early | 3 |
|  | Intervention/Early Childhood |  |
|  | SpecialEducation |  |
| SpEd 581 | Family Guided Early | 3 |
|  | Intervention |  |
| SpEd 582 | Specialized Techniques: Early | 3 |
|  | Intervention/Early Childhood |  |
|  | SpecialEducation |  |
| SpEd 583 | Communication and Language | 3 |
|  | Development:EI/SE (Early |  |
|  | Intervention/Early Childhood |  |
|  | SpecialEducation) |  |

SpEd 584 Assessment:EI/SE 3
SpEd 585 Instructional Strategies I: EI/SE 3
SpEd 586 Instructional Strategies II: EI/SE 3

Adding an EI/SEendorsement to a non-provisional teaching license may vary by state but is approximately 21 credits.
Subtotal: 55

## CENTERS

## The Autism Training and Research Center

The AutismTraining and Research Center provides training and consulting on evidence-based practices to educators and parents of individuals with autismspectrum dis orders, and conducts research in areas that are important to educators and families of individuals with autism spectrumdis orders.

## The Center for Student Success

503-725-9519
centerforsuccess@pdx.edu
The Center forStudent Success provides technical and consulting services to local and regional schools, school districts, education service districts, and nonprofit organizations working to increase student success and to bridge the achievement gap. The Center's experienced staff and consultants provide a rangeof services including programand grantevaluations, charter school evaluations, and professional development design and implementation.

## The Northwest Early Childhood Center for Education, Research, and Policy

The Northwest Early Childhood Center for Education, Research, and Policy (NWECC) is a collaboration of early childhood programs and centers which focus on education, research, and policy to improve the lives of all young children (birth to age 8) and their families within the PSU, local, regional and national communities. The NWECC is committed to communities in which all young children and their families thrive.

## The Oregon Center for Career Development in Childhood Care and Education (OCCD)

The Oreg on Center for Career Development in Childhood Care and Education (OCCD) provides leadership in the development and operation of integrated and statewide profes sional development standards and systems. OCCD promotes professional development to achieve high quality care and education for children and youth, and creates and supports training and education.
See www.pdx.edu/education-career-development.

## The Research Center on Inclusive and Effective Educational Practices (RCIEP)

The Research Center on Inclusive and Effective Educational Practices (RCIEP) serves as a catalyst and provides support to special education faculty in the development and implementation of externally funded research that significantly impacts the quality and effectiveness of intervention and instruction provided to children and youth with a variety of educational challenges, to their families and to the schools and agencies that serve them.

## MASEEH COLLEGE OF ENGINEERING AND COMPUTER SCIENCE

Joseph Bull, Dean
Chris Monsere, Associate Dean for Academic Affairs
Antonie Jetter, Associate Dean for Research
James Hook, As sociate Dean for International Partnerships
Jean Cavanaugh, Assistant Dean forFinance \&
Administration
Suite 500, Engineering Building
www.pdx.edu/engineering/

- B.S.-Civil Engineering, Computer Engineering, Computer Science, Electrical Engineering, Environmental Engineering and Mechanical Engineering
- Minor in Computer Science, ElectricalEngineering, EnvironmentalEngineering
- M.S.-Civil and Environmental Engineering, Computer Science, Electrical and Computer Engineering, Engineering and Technology Management, Mechanical Engineering, and Materials Science and Engineering
- M.Eng.-Civil and Environmental Engineering, Engineering and Technology Management (Option in Technology Management, Option in Project Management)
- Ph.D.-Civil and Environmental Engineering, Computer Science, Electrical and Computer Engineering, Mechanical Engineering, Technology Management
- Ph.D.-Participating college in Systems Science Doctoral Program
- Ph.D.-Participating college in Environmental Sciences andResources DoctoralProgram
- Graduate Certificates

Engineering and computer science professions will continue to be front and center in addressing grand challenges that affect society and the planet, from reinventing the built environment for human health to lowimpact energy sources, and resilient physical and cyber systems to effective tran sportation networks. For these reas ons, national projections indicate that the need for engineers and computer scientists will continue to increase signific antly during the years ahead, with commens urate increases in what are already high wages and opportunities to make substantial positivedifferences in the world.

All undergraduate programs are accredited by ABET and require a core of engineering or computer science, mathematics, science, and liberal arts courses. Graduate programs provide extended educational opportunities in various engineering and computer science specialties, from
cyber-security to healthy buildings, environmental monitoring to resilient infrastructure, technology management to nano-fabrication, water resources to artificial intelligence, neurosystems and robotics to power systems, and more.

## Undergraduate programs

At the undergraduate level, the student may select degree programs in civil engineering, computer engineering, environmentalengineering, computerscience, electrical engineering, and mechanical engineering.
The degree programs in civil engineering, computer engineering, electrical engineering, environmental engineering and mechanical engineering are accredited by the Engineering Accreditation Commission of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012 telephone: (410) 347-7700. The computer science program is accredited by the Computing Accreditation Commission of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012 - telephone: (410) 347-7700.

## DEGREE MAPS AND LEARNING OUTCOMES

Please refer to each department to view the degree maps and expected learning outcomes for Engineering and Computer Science's undergraduate degrees.

## ADMISSION REQUIREMENTS

## Policy on admission to undergraduate programs

Students may declare engineering or computer science as their major at any time after enrolling at Portland State University. However, students must be admitted formally to a specific degree programin civil engineering, computer engineering, computer science, electrical engineering, environmental engineering or mechanical eng ineering before they will (1) be allowed to enroll in restricted upperdivision courses offered by the programand (2) be graduated fromthat program. Students apply for formal department admis sion one to two terms before completing all eligibility requirements. Specific department application deadlines, criteria for admis sion and applications are available at the Maseeh College website: www.pdx.edu/engineering/upper-division-admis sions.

Students transferring fromother institutions who want to be admitted formally to a specific engineering degree program(civil engineering, computer engineering, computer science, electrical en gineering, environmental engineering, mechanical engineering) must:

- Meet all eligibility requirements.
- Apply for admission to PSU.
- Apply for programadmission to the Maseeh College of Engineering and Computer Science
Transfer students should consult the information and transfer guides posted on the Maseeh College website: www.pdx.edu/engineering/transfer-admis sions

Trans fer courses that are notevaluated by the Office of the Registrar or specified in other MCECS agreements as discrete numbered/direct equivalent courses will be evaluated by the department chair or their designee. In addition to the transcript, the student requesting the specific course equivalency may be asked to provide catalog descriptions and/or documents certify ing course content. To ensure that the student is well prepared for the current curriculum, course equivalency will be evaluated against the content of the current course. Appeals of transfer course equivalence may be made to the MCECS Associate Dean.

Please see department websites for more specific admissions information.

## Graduate programs

The Maseeh College of Engineering and Computer Science offers graduate programs leading to the degrees of Master of Science, Master of Engineering, Master of Software Engineering, and Doctor of Philosophy.

Master's programs are available in civiland environmental engineering, computer science, software engineering, electrical and computer engineering, mechanical engineering, engineering \& technology management, materials science and en gineering, and systems engineering.
Ph.D. programs are available in civil and environmental engineering, computer science, electrical and computer engineering, mechanical engineering, and technology management.
Graduate Certificates are also available in select departments.

## Master of Software Engineering

Suite 120
Fourth Avenue Building

- M.S.E.-Master of Software Engineering
- Graduate Certificate in Software Engineering

Applications to the Master of Software Engineering and the Graduate Certificate in Software Engineering have been suspended pending a major curriculumrevision.

## Systems Engineering

- M.Eng.-Systems Engineering
- Graduate Certificate

Systems Engineering is the practice of creating the means of performing useful functions through the combination of two or more interacting elements. Systems engineering focuses on defining customer needs and required functionality early in the development cycle, documenting requirements, then continuing with design synthesis and systemvalidation while considering the complete problem. Systems engineering integrates all the disciplines and specialty groups into a teameffort, forming a structured development process that proceeds from concept to production to operation. Many of us already practice systems en gineering, but call it something else: design or development of product, process, service. This course of study will enable the engineer to function in an interdisciplinary teamand apply their area of engineering specialty toward the development of a product, process, or service.

## ADMISSION REQUIREMENTS

## Master of Engineering and Graduate Certificate

In addition to meeting general University admission requirements (p.42), applicants to the programneed a minimum of three years of professional experience, baccalaureate degree, and at least 2.50 GPA . Admission is based on programapproval by the Director of Sys tems Engineering and the PSU Admissions office.

## M.ENG. SYSTEMS ENGINEERING

The Master of Engineering in Systems Engineering and the Certificate in Systems Engineering Fundamentals programs are currently approved for the ETM department; however, we are not accepting applications at this time.

| Systems Core |  |  |
| :--- | :--- | :--- |
| ETM 540 | Operations Research | 4 |
| SysE573 | Requirements Engineering | 4 |
| SysE591 | Systems Engineering Approach | 4 |

Subtotal: 12
Take one of the following:
$\begin{array}{lll}\text { SySc } 514 & \text { SystemDynamics } & 4 \\ \text { SySc } 527 & \text { Discmation } & 4\end{array}$
SySc 527 Discrete SystemSimulation 4

## Integrative Workshop

SysE590 Integrative Workshop 0-4

Subtotal: 4

## Project

You must take nine credits ofSysE506.
Subtotal: 9

## Hectives

See department for list of approved electives.
Subtotal: 16
Total Credit Hours: 45
SYSTEMS ENGINEERING FUNDAMENTALS

The Certificate in Systems Engineering Fundamentals programis currently approved forthe ETM department; however, we are not accepting applications at this time.

| Core |  |  |
| :--- | :--- | :--- |
| ETM 540 | Operations Research | 4 |
| SysE573 | Requirements Engineering | 4 |
| SysE591 | Systems Engineering Approach | 4 |

Subtotal: 12

## Hective

Choose one of the following:

| SySc 514 | SystemDynamics | 4 |
| :--- | :--- | :--- |
| SyS 527 | Discrate SystemSimulation | 4 |

SySc 527 Discrete SystemSimulation 4
SysE595 Hardware-Software Integration 4
Subtotal: 4

## Total Credit Hours: 16

## Civil and Environmental Engineering

Engineering Building
1930 SW 4th Ave., Suite 200
Email: ceedept@pdx.edu
Phone:503-725-4282
Web:www.pdx.edu/civil-environmental-engineering/

- B.S.-Civil Engineering
- B.S.-EnvironmentalEngineering
- Minor in Environmental Engineering
- M.S.-Civil and Environmental Engineering
- M.Eng.-Civil and Environmental Engineering
- Ph.D.-Civil and Environmental Engineering
- Graduate Certificate in Transportation
- Graduate Certificate in Hydrology
- Graduate Certificate in Sustainability

Civil and environmentalengineers plan, design, and manage the construction and operation of public and private infrastructure that are the foundation of our modern society including multimodal streets and highways, public transportation systems, water and was tewater dis tribution systems, energy s ystems, buildings, bridges, and dams. Civil engineers design structures such as buildings and bridges using concrete, steel, wood, masonry and composites. They are involved in predicting the quantity of water available for human use and in improving the quality of surface water, rivers, lakes, reservoirs, estuaries, and ground water systems. Civil engineers utilize fundamental understandings of rock and soil mechanics to design foundations, earth structures, and pavement subgrades. Finally, they are involved in understanding and improving air quality impacted by industrial, transportation and other pollution sources.

## Undergraduate programs - Civil and Environmental Engineering

## DEGREE MAPS AND LEARNING OUTCOMES

To view the degree maps and expected learning outcomes for Civil and Environmental Engineering's undergraduate degrees, go to www.pdx.edu/academic-programs/a-z.

## UPPER DIVISION PROGRAM ADMISSIONS REQUIREMENTS

## ADMISSIONS ELIGIBILITY - BSCE

To be eligible for admis sion to the BSCE Upper Division (Junior/Senior) program, each student must meet the following minimum requirements:

## 1. Complete with a minimum grade of $\mathbf{C}$ the following courses:

Mth 251
Mth 252
Mth 254
Mth 256
Mth 261
Ch 221
Ch 222
Ch 227
Ph $221 \quad$ General Physics (with Calculus) I
General Physics(with Calculus) 3
II
Ph $223 \quad$ General Physics (with Calculus)
Ph $214 \quad$ Lab forPh 201 or Ph 211 or Ph

| Ph 215 | Lab forPh 202 or Ph 212 or Ph <br> 222 orPh 232 | 1 |
| :--- | :--- | :--- |
| Ph 216 | Lab forPh 203 or Ph 213 or Ph | 1 |
| EAS 211 | 223 orPh 233 | Statics |

Ph 211-Ph 213 are interchangeable with Ph 221- Ph 223.
2. Have a minimum GPA overall of $\mathbf{2 . 3 3}$.
3. Complete a minimum of 90 credits.

## ADMISSIONS ELIGIBILITY - BSENVE

To be eligible for admission to the BSENVE Upper Division (Junior/Senior) Program, each student must meet the following minimum requirements:

| 1. Complete with a minimum grade of C the following courses: |  |  |
| :---: | :---: | :---: |
| Mth 251 | Calculus I | 4 |
| Mth 252 | Calculus II | 4 |
| Mth 254 | Calculus IV | 4 |
| Mth 256 | Applied Ordinary Differential Equations | 4 |
| Mth 261 | Introduction to Linear Algebra | 4 |
| Bi 234 | Elementary Microbiology | 4 |
| Bi 235 | Microbiology Laboratory | 2 |
| Ch 221 | General Chemistry I | 4 |
| Ch 222 | General Chemistry II | 4 |
| Ch 227 | General Chemistry Laboratory | 1 |
| Ch 228 | General Chemistry Laboratory | 1 |
| Ph 221 | General Physics (with Calculus) | 3 |
| Ph 222 | General Physics (with Calculus) | 3 |
|  | II |  |
| Ph 223 | General Physics (with Calculus) | 3 |
|  | III |  |
| Ph 214 | Lab forPh 201 or Ph 211 or Ph | 1 |
|  | 221 orPh 231 |  |
| Ph 215 | Lab forPh 202 or Ph 212 or Ph | 1 |
|  | 222 orPh 232 |  |
| Ph 216 | Lab forPh 203 or Ph 213 or Ph | 1 |
|  | 223 orPh 233 |  |
| EAS 211 | Statics | 4 |
| EAS 215 | Dynamics | 4 |

Ph 211-Ph 213 are interchangeable with Ph 221- Ph 223
2. Have a minimum GPA overall of $\mathbf{2 . 3 3}$.
3. Complete a minimum of 90 credits.

## SELECTIVE ADMISSION REQUIREMENTS BSCE AND BSENVE

## For students applying for 300-le vel CEE course admission

## Terms of Admission \& Deadlines

- Fall admission is typical to start the program. Other terms are considered on a case-by-case basis.
- Application is online on the CEE website. The deadline to apply is April 15. Contact the Department for additionaldetails and consideration for special circums tances at ceedept@ pdx.edu.
- If not a current PSU student, please apply first to PSU (http://www.pdx.edu/admis sions/)


## Minimum Requirements for Admission

- Complete (or have a plan to complete with spring and/or summer registrations) all required freshmen and sophomore classes on the Civil Engineering (CE) course plan or EnvironmentalEngineering (ENVE) course plan prior to the fall term of admis sion. Students may be admitted if they are mis sing one or more of the following courses:
- CE students: CE 111, CE 112, CE 115, CE 211/CE 212, up to 2 general education courses.
- ENVE students: CE 111, CE 112, CE 115, EAS 212, up to 2 general education courses.
- Earn a C orbetter letter grade in all required/shaded courses on the course plans. Note that Pass/No Pass grades are not acceptedunless the graded option was not available at student's institution for the course. Pass grades earned spring 2020 through spring 2021 will be accepted to the programand satisfy prerequisites requirements without restriction.


## Selective Admission Process

- All students who meet the minimumadmission requirements will be considered.
- A Selective Admis sion GPA will be calculated using only the required/shaded courses indicated on each course plan. If a P/NP grade is accepted, it will not be used in the calculation. Repeated classes will be treated with standard PSU repeat/replace policy:
- If a studentearned a $\mathrm{D}+$ or below in a class the first time, then only the repeated (second) grade will be used in the SelectiveGPA calculation.
- If a studentearned a C - or above in a class the first time, then both the first grade and the second (repeated) grade will be used in the Selective GPA calculation.
- Should a class be taken a third time it does not replace the second attempt regardless of either grade.
- Applicants with a Selective Admission GPA of 3.0 or above, and who are in progress to complete all required lower division courses by the fall admis sions term, will be admitted. Remaining admis sion will be prioritized by the Selective admis sion GPA with the total number admitted based on available clas s and lab capacity.
- Students with low Selective Admission GPAs may be offered or required to complete the CEEUpper Division Preparation course. If required, successful completion of the Summer Bridge may result in admis sion to the UpperDivision program.
- Admission decisions will be communicated to the studentby email. Decisions will be:
- Admit
- Admit, Recommend CEE UpperDivision Preparation Course
- Defer, Require CEE Upper Division Preparation Course
- Defer, Wait for Spring or Summer Grades
- Deny
- Denied students may request a meeting with the Department Chair to review the decision.


## Continuation Criteria-BSCE and BSENVE

After admis sion to the Upper Div is ion Program, students will be expected to make satisfactory progress toward their declared degree (BSCE or BSENVE).

Satisfactory progress is defined as:

- The term GPA in all courses taken at PSU must be 2.0 or higher.
- Completion of 12 credits toward the degree in an academic year.

Students failing to meet (1) or (2) of the progress criteria will be placed on probation.

Students will be suspended fromthe degree programif:

- The student is placed on probation fortwo consecutive terms or for a total of three terms.
- The student has not enrolled in an engineering course for three consecutive terms.

Students who are suspended will not be allowed to take courses in civil or environmental engineering programfor one termfollowing suspension. Summer term is included in this calculation. Students who wish to bereadmitted to the programneed to schedule and attend an advising ses sion with the Department Chair or designee. If readmitted, the suspended student will be given clear continuation criteria that may exceed the pre-suspension satisfactory progress (continuation criteria) listed above. Failure to meet the revis ed continuation criteria following the first sus pension will result in permanent suspension from the academic program.

## Appeals

Students may appeal department admission decisions or department continuation criteria decisions by submitting a petition to the Department Chair. The Chair's decision can be appealed to an ad-hoc departmental appeal's committee consisting of three faculty. The committee will review the appeal and communicate a written decision to the Department Chair and student. The committee's decision can be appealed to the Associate Dean of MCECS (info@cecs.pdx.edu).

## CIVIL ENGINEERING B.S. (BSCE)

The BSCE degree includes required andelective courses in structural analysis and design, environmental engineering, water resources, transportation engineering or geotechnical en gineering.

Students may elect to focus coursework in a specialty area in their senior year through electives. The program
culminates with a final caps tonedesign course that allows students to apply many of the principles and concepts on a community-serving project.
The BSCE programis accredited by Engineering Accreditation Commis sion of ABET, 415 North Charles Street, Baltimore, MD 21201, a national organization that sets standards for engineering education defined in terms of curricular content, quality of faculty, and adequacy of facilities of eng ineering programs.

## BSCE Program Educational Objectives

The civil engineering programat Portland State University prepares graduates to practice civil engineering res ponsibly and ethically by (1) working effectively in the professional engineering community and (2) continuing to learn and enhance their abilities in civil engineering.

## BSCE Student Outcomes

Graduates of the civilengineering programat Portland State University will have the skills and abilities to prepare themto begin professional practice or to succeed in graduate studies.
Graduates will have:

- an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
- an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
- an ability to communicate effectively with a range of audiences
- an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, en vironmental, and societal contexts
- an ability to function effectively on a teamwhose members together provide leadership, create a collaborative and inclusive environment, es tablish goals, plan tasks, and meet objectives
- an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions - an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.


## REQUIREMENTS

BSCE majors must complete all University (p.31) and department degree requirements:

1. Freshmen and sophomore math, science, and engineering courses must be completed with a minimum grade of C ;
2. Junior and senior engineering and science courses, and EC 314 U must be completed with a minimum grade of C-;
3. Prerequis ite courses must be passed with the minimum grade ("C" for 100 and 200 level courses, "C-" for 300 and 400 level courses) or better in order to move ahead in the sequence;
4. The student's cumulativePSU GPA must be 2.33 or higher to graduate from the BSCE program;
5. Any deviation from the required courses including engineering and mathematics substitutions must be approved in writing by the Department Chair.

Transferstudents should follow the information found on the MCECS Transfer
Page:https://www.pdx.edu/cecs/transferring-credits.

## Freshman Year

CE 111 Introductionto Civil and EnvironmentalEngineering
CE 112 Civil and Environmental 3 Engineering Computations
CE 115 Civil Engineering Drawing and
Spatial Analysis
Ch 221 General Chemistry I 4
Ch 222 General Chemistry II 4
Ch 227 General Chemistry Laboratory 1
Ch 228 General Chemistry Laboratory 1
Mth 251 Calculus I 4
Mth $252 \quad$ Calculus II 4
Mth 261 Introduction to Linear Algebra 4
Freshman Inquiry 15
Subtotal: 46

## Sophomore Year

EAS 211 Statics
EAS 212 Strength of Materials 4
EAS 215 Dynamics 4
CE 211 Plane Surveying and Mapping 3
CE 212 Field Problems in Plane 1
$\begin{array}{ll}\text { Mth } 254 & \text { Surveying } \\ \text { Calculus IV }\end{array}$
Mth 256 Applied Ordinary Differential 4
Ph 221 General Physics (with Calculus) 3
Ph 222 General Physics (with Calculus) 3
II
Ph 223 General Physics (with Calculus)
3

| Ph 214 | Lab for Ph 201 or Ph 211 or Ph 221 orPh 231 | 1 |
| :---: | :---: | :---: |
| Ph 215 | Lab for Ph 202 or Ph 212 or Ph | 1 |
|  | 222 orPh 232 |  |
| Ph 216 | Lab forPh 203 or Ph 213 or Ph | 1 |
|  | 223 orPh 233 |  |
|  | Sophomore Inquiry | 8 |
| Subtotal: 44 |  |  |
| Junior Year |  |  |
| CE 315 | The Civil and Environmental | 1 |
|  | Engineering Profession |  |
| CE 316 | Applied Probability and | 4 |
|  | Statistics for Civil \& |  |
|  | Environmental Engineering |  |
| CE 321 | CEE Properties of Materials | 4 |
| CE 361 | Fluid Mechanics | 4 |
| CE 324 | Elementary Structural Analy sis | 4 |
| CE 325 | Indeterminate Structures | 4 |
| CE 341 | Soil Classification and Properties | 4 |
| CE 351 | Introductionto Transportation | 4 |
|  | Engineering |  |
| CE 362 | Engineering Hydraulics | 4 |
| CE 364 | Water Resources Engineering | 4 |
| CE 371 | Environmental Engineering | 4 |
| G 301 | Geology for Engineers | 3 |
| Ec 314U | Private and Public Investment | 4 |
|  | Analysis |  |

Subtotal: 48
Ec 314 U is a required course that can be taken as a part of some upper-division clusters.

| Senior Year |  |  |
| :---: | :---: | :---: |
| CE 444 | Geotechnical Design | 4 |
| CE 484 | Civil \& Environmental | 3 |
|  | Engineering Project Management and Design I |  |
| CE 494 | Civil \& Environmental | 3 |
|  | Engineering Project Management and Design II |  |
|  | One Structural DesignElective | 4 |
|  | One Transportation Design | 4 |
|  | Elective |  |
|  | Approvedcivilengineering electives | 19 |
|  | Upper-division cluster | 8 |
| Subtotal: 45 |  |  |
| Approved Structural Design Elective: |  |  |
| CE 432 | Structural Steel Design | 4 |
| CE 434 | Principles of Reinforced | 4 |
|  | Concrete |  |
| Approved Transportation Design Elective: |  |  |
| CE 450 | Transportation Safety Analysis | 4 |
| CE 458 | Public Transportation Systems | 4 |
| CE 459 | Transportation Operations | 4 |

CE 462
CE 493
Traffic Engineering Applications
4 and SignalTiming Design and Operation of Bicycle 4 and Pedestrian Infrastructure
Approved Civil Engineering Electives:

| CE 401 | Research | $1-6$ |
| :--- | :--- | ---: |
| CE 403 | Honors Thesis | $1-4$ |
| CE 404 | Cooperative Education/Internship | $1-12$ |
| CE 405 | Reading and Conference | $1-6$ |
| CE 406 | Special Projects | $1-6$ |
| CE 407 | Seminar | $1-6$ |
| CE 410-499 |  |  |
| CE 510-599 |  |  |

CE 401 - CE 406: 4 credits recommended maximum across all numbers, 2 maximum for CE 404 Internship credit; additional credits require Department Chair approval.

CE 407: 3 credits recommended maximum; additional credits require Department Chair approval. Subtotal: 183

Students may take one course outside theCEE Department to apply toward senior electives. Approved non-CE courses are ME321, ME455 (p. 933), G 424 (p. 824), Geog 488 (p. 842), and Geog 492 (p. 843). Additional nonCE classes require prior approval of the CEE Department; requests should be sent to ceedept @pdx.edu prior to the start of the term.

## ENVIRONMENTAL ENGINEERING B.S.(BSENVE)

The BSENVE programprovides training for engineers to preserve the naturalenvironment - an especially important part of ourculture in Portland and in the stateof Oregon. Oregon prides itself on its environmental commitments and efforts toward living sustainably. This degree focuses on the fundamentals of environmental and water resources engineering with required andelective courses in geoenvironmental, surface water hydrology, surface and groundwater water quality, ground water hydrology, and air quality. The programincludes foundational and fundamental courses in chemistry, mathematics and statistics, physics, geology and biology. The program culminates with a final capstonedesign course that allows students to apply many of the principles and concepts on a community-serving project.
The BSENVE programat Portland State University is accredited by the Engineering Accreditation Commis sion of ABET, 415 North Charles Street, Baltimore, MD 21201, a national organization sets standards for curricular content, quality of faculty, and adequacy of facilities of engineering programs.

## BSENVE ProgramEducational Objectives

The environmental engineering programprepares graduates to practice environmental engineering responsibly and ethically by (1) working effectively in the profes sional en gineering community and (2) continuing to learn and enhance their abilities in environmental engineering.

## BSENVE Student Outcomes

Graduates of the en vironmental engineering program will have the skills and abilities to prepare them to begin profes sional practice or to succeed in graduate studies.

Graduates will have:

- an ability to identify, formulate, and solve complex
engineering problems by applying principles of engineering, science, and mathematics
- an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
- an ability to communicate effectively with a range of audiences
- an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
- an ability to function effectively on a teamwhose members together provide leadership, create a collaborative and inclusive environment, es tablish goals, plan tasks, and meet objectives
- an ability to develop and conduct appropriate
experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
- an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.


## REQUIREMENTS

BSENVE majors must complete the following University and department degree requirements for their engineering coursework.

1. Freshmen and sophomore math, science, and engineering courses must be completed with a minimum grade of C ;
2. Junior and senior engineering and science courses, and EC 314U must be completed with a minimum grade of C-;
3. Prerequisite courses must be passed with the minimum grade ("C" for 100 and 200 level courses, "C-" for 300 and 400 level courses) or better in order to move ahead in the sequence;
4. The student's cumulativePSU GPA must be 2.33 or higher to graduate fromthe BSENVE program;
5. Any deviation from the required courses including engineering and mathematics substitutions must be approved in writing by the Department Chair.

Transferstudents should follow the information found on the MCECS Transfer
Site: https://www.pdx.edu/cecs/transferring-credits
Freshman Year

| CE 111 | Introductionto Civil and <br> Environmental Engineering | 3 |
| :--- | :--- | ---: |
| CE 112 | Civil and Environmental <br> CE 115 | Engineering Computations <br> Civil Engineering Drawing and |
|  | Spatial Analy sis | 3 |
| Ch 221 | General Chemistry I | 3 |
| Ch 222 | General Chemistry II | 4 |
| Ch 227 | General Chemistry Laboratory | 4 |
| Ch 228 | General Chemistry Laboratory | 1 |
| Mth 251 | Calculus I | 1 |
| Mth 252 | Calculus II | 4 |
| Bi 234 | Elementary Microbiology | 4 |
| Bi 235 | Microbiology Laboratory | 4 |
|  | Freshman Inquiry | 2 |

Subtotal: 48
Sophomore Year
EAS 211 Statics 4
EAS 212 Strength of Materials 4
EAS 215 Dynamics 4
Mth 261 Introduction to Linear Algebra 4
Mth 254 Calculus IV 4
Mth 256 Applied Ordinary Differential 4 Equations
Ph 221 General Physics (with Calculus) 3
Ph 222 General Physics (with Calculus) 3
Ph 223 General Physics (with Calculus) 3
Ph $214 \quad$ Lab for Ph 201 or Ph 211 or Ph 1 221 or Ph 231
Ph $215 \quad$ Lab for Ph 202 or Ph 212 or $\mathrm{Ph} \quad 1$ 222 or Ph 232
Ph $216 \quad$ Lab for Ph 203 or Ph 213 or $\mathrm{Ph} \quad 1$
223 or Ph 233
Sophomore Inquiry 8
Subtotal: 44
Junior Year
CE 315

CE 316

CE 345

The Civil and Environmental 1 Engineering Profession Applied Probability and Statistics
for Civil \& Environmental Engineering
EnvironmentalSoilMechanics

1

| CE 361 | Fluid Mechanics | 4 |
| :---: | :---: | :---: |
| CE 362 | Engineering Hydraulics | 4 |
| CE 364 | W ater Resources Engineering | 4 |
| CE 371 | Environmental Engineering | 4 |
| CE 412 | Sustainability in Civil \& | 1 |
|  | EnvironmentalEngineering Seminar |  |
| EnvE365 | PhysicalEnvironmental | 2 |
|  | Processes |  |
| EnvE 366 | Analytical Methods in | 2 |
|  | Environmental Engineering |  |
| EnvE368 | Physical Environmental Process | 2 |
|  | Lab |  |
| EnvE 369 | Analytical Methods in | 2 |
|  | EnvironmentalEngineering Lab |  |
| EnvE 370 | Sampling, Analysis and Risk | 2 |
|  | Assessment for Environmental |  |
|  | Engineering Lab |  |
| G 301 | Geology for Engineers | 3 |
| ME 321 | Engineering Thermodynamics I | 4 |
|  | Subtotal: 41 |  |
| Senior Year |  |  |
| CE 474 | Unit Operations of | 4 |
|  | Environmental Engineering |  |
| CE 480 | Chemistry of Environmental | 4 |
|  | Toxins |  |
| CE 484 | Civil \& Environmental | 3 |
|  | Engineering Project |  |
|  | Management and DesignI |  |
| CE 494 | Civil \& Environmental | 3 |
|  | Engineering Project |  |
|  | Management and Design II |  |
| Ec 314U | Private and Public Investment | 4 |
|  | Analysis |  |
|  | Upper-division cluster | 8 |
|  | ApprovedEnvironmental | 24 |
|  | Engineering Electives |  |

Ec 314 U is a required course that can be taken as a part of some upper-division clusters.

Electives:see below.

## Approved Environmental Engineering Eectives:

There are approved electives in geo-environmental engineering, surface water quality, surface hydrology and hydraulics, subsurface hydrology and contaminant trans port, and air quality. 24 credits of technical electives are required to complete the BSENVE degree; a variety of the classes listed below are available each academic year.

| CE 401 | Research | $1-6$ |
| :--- | :--- | :--- |
| CE 403 | Honors Thesis | $1-4$ |


| CE 404 | Cooperative | 1-12 |
| :---: | :---: | :---: |
|  | Education/Internship |  |
| CE 405 | Reading and Conference | 1-6 |
| CE 406 | Special Projects | 1-6 |
| CE 407 | Seminar | 1-6 |
| CE 410 | Selected Topics | 0-6 |
| CE 445 | Geo-environmentalEngineering with Geosynthetics | 2 |
| CE | Fate and Transport of Toxics in | 4 |
| 479/ESM | the Environment |  |
| 479 |  |  |
| CE 480 | Chemistry of Environmental Toxins | 4 |
| CE 481 | The Columbia River as a System | 2 |
| CE 482 | Introductionto Sediment | 4 |
|  | Transport |  |
| CE 483 | Estuarine Circulation | 4 |
| CE 469 | Subsurface Hydrology | 4 |
| CE 485 | EnvironmentalCleanup and | 4 |
|  | Restoration |  |
| CE 486/Ch | EnvironmentalChemistry | 4 |
| 486 |  |  |
| CE 487/Ch | Aquatic Chemistry | 4 |
| 487 |  |  |
| CE | Air Quality | 4 |
| 488/ESM |  |  |
| 460 |  |  |
| CE 489 | Introductionto Advanced | 4 |
|  | EnvironmentalFluid Mechanics |  |
| CE 490 | Soil and Groundwater | 4 |
|  | Restoration |  |
| CE | Watershed Hydrology | 4 |
| 565/ESM |  |  |
| 525 |  |  |
| CE | EnvironmentalData Analysis | 4 |
| 566/ESM |  |  |
| 566 |  |  |
| CE 568 | Advanced Methods in | 4 |
|  | Hydrologic System Analysis |  |
| CE 571/CE | Subsurface Contaminant | 4 |
| 671 | Transport |  |
| CE 572 | EnvironmentalFluid Mechanical | 4 |
|  | Transport |  |
| CE 573 | Numerical Methods in | 4 |
|  | Environmental and Water |  |
|  | Resources Engineering |  |
| CE 576 | EnvironmentalFluid Mechanics | 4 |
| CE 578 | Water Quality Modeling | 4 |

CE 401 - CE 406: 4 credits recommended maximum across all numbers, 2 maximum for CE 404 Internship; additional credits require Department Chair approval.

CE 407 in ENVE discipline area: 3 credits recommended maximum; additional credits require Department Chair approval.

CE 410 in ENVE discipline area only.

BSENVE Students are also allowed to take one of the following courses for elective credit:

Ph 375U (p. 1048), Ph 471, Ph 477, G 424 (p. 824), Geog 488 (p. 842), or Geog 492 (p. 842). Additional elective classes outside of the CEsubject area require prior approval from the CEE Department; requests should be sent to ceedept@ pdx.edu prior to the start of the term. Subtotal: 183

## ENVIRONMENTAL ENGINEERING MINOR

## Preparatory Prerequisite Courses

These courses are required preparation for the Environmental Engineering Minor required courses, but are not part of the stated minor. Please meet with an Engineering Advisor for course planning support.

| Mth 251 | Calculus I | 4 |
| :--- | :--- | :--- |
| Mth 252 | Calculus II | 4 |
| Mth 261 | Introduction to Linear Algebra | 4 |
| EAS 211 | Statics | 4 |
| EAS 215 | Dynamics | 4 |

Subtotal: 20

## REQUIREMENTS

A student wishing to minor in environmental engineering must complete the following courses with a minimum grade of C and a minimum GPA of 2.33 :

## Courses

Mth 254
Mth 256
Calculus IV
4
Ph 221 Equations
Ph 221 General Physics (with Calculus)I 3
Ph 222 General Physics (with Calculus) 3
Ph 223 General Physics (with Calculus) III
Ph 214
Lab for Ph 201 or Ph 211 or Ph
221 or Ph 231
Ph 215
Lab for Ph 202 or Ph 212 or Ph 222 or Ph 232
Ph 216
Lab for Ph 203 or Ph 213 or Ph 223 or Ph 233
Ch 221
General Chemistry I
Ch 222
General Chemistry II
4

General Chemistry Laboratory
Ch 227 Geral Chery
1
Ch 228 General Chemistry Laboratory 1

| CE 361 | Fluid Mechanics | 4 |
| :--- | :--- | :--- |
| CE 362 | Engineering Hydraulics | 4 |
| CE 364 | Water Resources Engineering | 4 |
| CE 371 | Environmental Engineering | 4 |
| CE 474 | Unit Operations of | 4 |
|  | Environmental Engineering |  |

Subtotal: 54
and a minimum of 4 credits of approvedelectives. All courses must be taken for letter grade and at least one-third of the credit hours must be taken at Portland State University.
Subtotal: 54
Course requirements for the minor also meet partial eligibility requirements for admis sion to the BSCE or BSENVE programs. Students who complete the requirements for the minor may wish to apply for admission to these programs. BSCE and BSENVE students cannot minor in environmental engineering. Students can schedule a meeting with an Engineering Advisor by calling 503.725.4631.

## HONORS PROGRAM - BSCE AND BSENVE

The Civil and Environmental Engineering Honors Program gives highly-motivated engineering students thechance to develop undergraduate degree programs that reflect their particular interests - many of thesestudents go on to graduate school. Working closely with a CEE faculty advisor, Honors Programstudents choose a research area and complete an Honors thesis, usually during their senior year.

## Honors Program Admissions Requirements:

- Submit CEE Honors Programapplication formfound on the CEE website (www.pdx.edu/cee);
- Completion of a minimum of 90 credit hours;
- Completion of courses required for admission to the BSCE or BSENVE programs;
- Minimum PSU GPA of 3.50

Interested students should apply by spring quarter of the junior year but no later than the beginning of his/her senior year.
Upon acceptance into the Honors Program, the student will declare one of the following areas of interest within CEE for his/her research topic: Environmental/Water Resources, Geotechnical, Structural, or Transportation. The CEE Chair, in consultation with faculty, will assign the student an Honors advisor. The advisor will work with the student to complete a written proposalfor the Honors thesis research. Honors thesis will follow ASCE document guidelines for style and formatting. CEE students who meet Honors Programrequirements will graduate with

Honors and will receive special recognition on their diploma.

## Honors Program Graduation Requirements:

- Completion of a written honors thesis in conjunction with a faculty adviser with a minimum grade of $\mathrm{B}+$
- Presentation of research to CEE faculty/students in seminar format
- PSU GPA above 3.50

Note: The Honors thesis will count as a BSCE or BSENVE elective in the senior year: CE 403, Honors Thesis, 4 credit hours. Studentsin the University Honors Program can substitute HON 403 for CE 403 credits, and apply the thesis credits to both the University Honors Program requirements, as well as the CE or ENVE engineering elective requirements. Students working in both programs should schedule advising sessions with both the University Honors Program and the CEE Department early to ensure correct course planning for those two programs.

## BACHELOR'S + MASTER'S PATHWAY

The Bachelors+Masters Pathway allows currently admitted PSU BSCE or BSENVE students to get a head-start on their master's degree. Undergraduate students admitted into the Bachelors+Masters Pathway are able to take up to 16 credit hours of electives taken at 500 level and apply these credits to both their undergraduate and graduate degree requirements. This benefit of shared coursework credit effectively shortens the minimumtime required to complete the master's degree. The CEE Master's program requires meeting the appropriatecore and elective course requirements for an individual speciality area in structural, geotechnical, transportation, or environmental and water resources engineering.

Pathway students must still apply to the Graduate Program and will be admitted to the CEE Master's graduate programas long as the Bachelors+Masters Pathway continuation criteria are satisfied. Students must start their master's programwithin one academic year of BSCE/BSENVE graduation in order to use their pathway courses towards their mas ter's degree. Students not meeting the continuation criteria can still apply for admission to the master's degree programwithout the benefits of shared coursework credits.

As an undergraduate student, the cost of the 500 level credits will be at the undergraduate tuition rate. Post-bac students will be charged graduate rates per PSU policy. To be eligible for the Pathway program, students must meet the PSU institutional requirement for residency for the undergraduate degree program ( 45 of the last 60 credits to be taken in residence at PSU).

## Application of Shared Coursework Credits

Once a Bachelors+Masters Pathway student is formally admitted into the graduate CEE program, the Department will request the 500 level credits taken as an undergraduate to be applied to the master's degree. Note that:

- Only coursework with a grade ofB, or higher, will be applied.
- Any coursework taken prior to formal admission into the Bachelors+Masters Pathway is noteligible for shared credit.


## Admission Criteria to Pathway Program

Students that meet the following admission criteria for the Bachelors +Masters Pathway will receive notificationfrom the CEE Department that they are eligible to be enrolled in the program:

- Formally admitted into thePSU BSCE/BSENVE

Program.

- Completed 16 credit hours of approved 300 or 400 level upperdivision BSCE/BSENVE coursework, excluding university studies upper division cluster courses.
- InstitutionalGPA of 3.30 at time of eligibility notification.
Eligible students mustrespond to theCEE Department eligibility notification with intent to join the pathway programby April 15th of the same year to be admitted to the Pathway.


## Continuation Criteria Pathway Program

- Maintain an institutional GPA of 3.30 throughto completion of BSCE/BSENVE degree
- Enroll in CEE Master's graduate programwithin 1 year of graduation from BSCE/BSENVE


## Graduate programs-Civil and Environmental Engineering

## ADMISSION REQUIREMENTS

## MS and MEng

Admis sion requirements for the MS and MEng degrees include a bachelor's degree in an engineering field, science, or closely related area with a minimum GPA of 3.00. Courses should include calculus through differential equations, physics and chemistry, and all the necessary prerequis ites for the graduate courses that comprise the student's programofstudy. Applicants without these qualifications may be considered for conditional admission. To be considered for admis sion as a conditional student, the applicant musthave a minimum GPA of 2.75. Applicants must als o meet PSU graduate admis sion requirements. Please refer to Graduate Studies for these
requirements. Application instructions for the MS and MEng programs are available at pdx.edu/cee/graduateadmissions.

## PhD

Admis sion requirements for the PhD programinclude a MS degree in an engineering field, science, or closely related area. All applicants must contact a CEE faculty member prior to submitting an application seeking a PhD advis or. For admission, a student must have a CEE faculty member agree to be his/her PhDadvisor. Applicants must also meet PSU graduate admis sion requirements. Please refer to Graduate Studies for these requirements. Application instructions for the PhD programare available at pdx.edu/cee/graduate-admissions.

## CIVIL AND ENVIRONMENTAL <br> ENGINEERING MS

The Master of Science in Civil and Environmental Engineering programis designed to provide students with the technical and professional knowledge necessary to develop their abilities to seek creative solutions to complex problems in their field of interest. The programinvolves advanced courses in the areas of structural analy sis and design, transportation engineering, water resources, environmental engineering, and geotechnical engineering, as well as science and mathematics. Flexibility is achieved by designing programs of study to meet individual needs. MS students must complete a thesis or research project conducted under the supervision of a faculty member. Please see the Degree Requirements section for full details.

## Application Deadlines -MS

- Fall - January 1 (for strongest consideration for funding as a Graduate Research or Teaching Assistant)
- Winter-September 1
- Spring - November 1


## Degree Requirements - MS

MS students are required to complete tentative degree plans after completing 18 credits. The degree plan must be approved by their advisor. An MS study plan formfor this purpose is available on the CEE website (www.pdx.edu/cee). Cours ework taken without advisor approval may not be accepted as part of the student's program. Students mustalso meet the University master's degree requirements.
The MS programconsists of two options:

- The thesis option consists of a total of 45 credit hours including 6-9 hours of CE 503 Thes is credits plus successful completion of a final oral examination covering the thesis. Coursework may include up to 6 hours of CE 501 Research, CE 504 Internship, CE505 Reading and Conference, or CE506 Projects;
- The project option requires completion of 45 credit hours including 4CE 501 Research credit hours on a research project that produces a report and technical presentation. Coursework may include up to 8 hours of CE 504 Internship, CE505 Reading and Conference, or CE 506 Projects.

Internship credits (CE 504) require a project and final report; these credits must be arranged in advance between the CEE faculty advisor and the student.

Student research is conducted under the supervision of faculty. Please see CEE faculty profiles on the CEE website (www.pdx.edu/cee) to learn about current faculty research areas.

CEE courses for which the student receives a grade of "C+" or lower will not be counted toward fulfilling the requirements. Grades of $\mathrm{C}+\mathrm{C}$, or C - may sometimes be counted toward the degree with the approval of the student's advisor and the Graduate ProgramChair.

All courses taken in the Department of Civil and Environmental Engineering by degree candidates must be taken for a letter grade, unless a course is only offered with a pass/nopass option. Courses outside the Department of Civil and Environmental Engineering may be taken pass/no pass only with theconsent of the student's advisor. Non-degree seeking students may take Civil and Environmental Engineering courses pass/no pass with the consent of the instructor.

In both options, a minimum of 30 credit hours must be taken in the CEE Department unless otherwise approved by the Graduate ProgramChair. To become a candidate for the MS degree, the student must successfully complete all departmental requirements for one of the options described above.
Departmental policies and other helpful information for graduate students can be found in the Department's Graduate Handbook, located on the CEE website (www.pdx.edu/cee). All other degree requirements for the MS programare established by PSU's Graduate School. Please refer to the Graduate School for information concerning adv anced degree requirements, degree status, petition processes, thesis preparation, and final oral exam.

## CIVIL AND ENVIRONMENTAL ENGINEERING MENG

The Master of Engineering in Civil and Environmental Engineering programis a non-research based professional degree. MEng students may be full-time or part-time while working in the engineering field. These students complete an advanced degree without a thesis/project requirement and can also use internship credits toward their degree.

Please see the Degree Requirements section below for full details.

MEng students are required to complete tentative degree plans after completing 18 credits. The degree plan must be approved by their advisor. An MEng study plan formfor this purpose is available on the CEE website (www.pdx.edu/cee/graduate-programs). Cours ework taken without advis or approvalmay not be accepted as part of the student's program. Students must also meet the University master's degree requirements.

## Application Deadlines - MEng

- Fall - January 1
- Winter - September 1
- Spring - November 1


## Degree Requirements - MEng

A total of 48 graduate credits are required for the MEng program. Coursework may include up to 8 hours of CE 501 Research, CE504 Internship, CE505 Reading and Conference, or CE506 Projects.

Internship credits (CE 504) require a project and final report; these credits must be arranged in advance between the CEE faculty advisor and the student.
CEE courses for which the student receives a grade of "C+" or lower will not be counted toward fulfilling the requirements. Grades of $\mathrm{C}+\mathrm{C}$, or C - may sometimes be counted toward the degree with the approval of the student's advis or and the Graduate ProgramChair.

All courses taken in the Department of Civil and Environmental Engineering by degree candidates must be taken for a letter grade, unless a course is only offered with a pass/no pass option. Courses outside the Department of Civil and Environmental Engineering may be taken pass/no pass only with theconsent of the student's adviser. Non-degree seeking students may take Civil and EnvironmentalEngineering courses pass/no pass with the consent of the ins tructor.

A minimum of 30 credit hours must be taken in the CEE Department unless otherwise approved by the Graduate ProgramChair. To become a candidate for the MEng degree, the student must successfully complete all departmental requirements as described above.

Departmental policies and other helpful information for graduate students can be found in the Department's Graduate Handbook, located on the CEE website (www.pdx.edu/cee). All other degree requirements forthe MEng programare established by PSU's Graduate School. Please refer to the Graduate School for information
concerning adv anced degree requirements, degree status, and petition processes.

## CIVIL AND ENVIRONMENTAL ENGINEERING PHD

The PhD in Civil and Environmental Engineering program offers advanced courses in the areas of structural analy sis and design, water resources and environmental engineering, transportation engineering, and geotechnical engineering. This programaims to educate technical experts to meet challenges related to enhancing infrastructure and the environment. Students learn about conducting research and solving technical problems that have an impact both regionally and globally. The PhD programculminates in a written dissertation representing an original contribution to knowledge in the field, significantly enlarging, modifying or reinterpreting what was previously known. Students work closely with their advisor, but PhD research is an original, independent investigation of the chosen research topic.

## Application Deadlines - PhD

- Fall - January 1 (forstrongest consideration for funding as a Graduate Research or Teaching Assistant)
- Winter-September 1
- Spring - November 1


## Degree Requirements - PhD

A PhD student must complete the following departmental requirements:

1. Complete a minimum of 51 credits (including coursework and dissertation credits) beyond the M.S. degree;
2. Complete an approved program of study, which includes a minimum of 24 hours coursework. Cours ework may include up to 8 hours of CE 601 Research, CE604 Internship, CE605 Reading and Conference, or CE 606 Projects;
3. Meet the University's residency requirement;
4. Pass the comprehensive examination;
5. Present and pass a proposal defense for advancement to candidacy;
6. Complete 27 credit hours of dis sertation credit (CE 603) leading to the completion of a doctoral dissertation;
7. Present and pass the final oral dissertation defense; and
8. Submit the written dis sertation in compliance with University guidelines and deadlines.

Internship credits (CE 604) require a project and final report; these credits must be arranged in advance between the CEE faculty advisor and the student. CEE courses for which the student receives a grade of " $\mathrm{C}+$ " or lower will not be counted toward fulfilling the requirements. Grades of $\mathrm{C}+\mathrm{C}$, or C - may sometimes be counted toward the degree with the approval of the student's advisor and the Graduate ProgramChair.
All courses taken in the Department of Civil and Environmental Engineering by degree candidates must be taken for a letter grade, unless a course is only offered with a pass/nopass option. Courses outside theDepartment of Civil and Environmental Engineering may be taken pass/no pass only with theconsent of the student's advisor. Non-degree seeking students may take Civil and Environmental Engineering courses pass/no pass with the consent of the instructor.
Departmental policies and other helpful information for graduate students can be found in the Department's Graduate Handbook, located on the CEE website (www.pdx.edu/cee). All other degree requirements for the PhD programare established by PSU's Graduate School. Please refer to the Graduate School for the university's doctoral degree requirements.

## HYDROLOGY GRADUATE CERTIFICATE

The Graduate Certificate of Hydrology is designed to give students advanced training in hy drology, and leads to profes sional certification with the American Institute of Hydrology (AIH). Requirements for the certificate are listed within the Environmental Science and Management section (p.258).

## SUSTAINABILITY GRADUATE CERTIFICATE

The Graduate Certificate in Sustainability offers an integrated series of post-baccalaureate courses that allow students to deeply explore and understand the three spheres of sustainability: social, economic, and environmental. The courses cover theory as well as practice, providing experience analyzing real-world approaches and solutions. Courses can be taken by students admitted solely to the certificate programorconcurrently enrolled in masters and doctoral programs at PSU. The certificate is adminis tered by the Economics department (p. 396). More information about thecertificate and application procedures can be found at https://www.pdx.edu/economics/academics/programs/grad uate/sustainability-graduate-certificate.

## TRANSPORTATION GRADUATE CERTIFICATE

The Graduate Certificate in Transportation is a 21 credit hour programdesigned to build the technical and analy tical
knowledge of those who are in or wish to enter the transportation field. This programcould be completed in a single year on a full-time basis or over two years on a parttime bas is. The certificate includes courses from the Toulan School of Urban Studies and Planning and the Department of Civil and Environmental Engineering. Credits taken as part of this certificate programmay be used to satisfy partial M.S. degree requirements in either program. Admis sion to this program will require an undergraduate degree at an accredited university and a GPA that meets university admis sion requirements. More information about thecertificate and application procedures can be found in the catalog listing (p. 425).

## Computer Science

120 Fourth Avenue Building 503-725-4036
www.pdx.edu/computer-science/

- B.S.-ComputerScience
- Minor in Computer Science
- M.S.-ComputerScience
- Ph.D.-Computer Science
- Graduate Certificate in ComputerSecurity

The Department of Computer Science offers a full range of courses and degree programs that are designed to provide students with the educational background to achieve a career in the computing industry. We offer a community to learn, discover, innovate, and share a curriculumbased on the application and theoretical foundations of Computer Science. Ourfaculty members specialize in a variety of research areas such as artificial intelligence \& machine learning; computer science education; computer security \& privacy; computer vision \& computer graphics; data science; natural language processing; programming languages \& formal methods; software eng ineering; systems \& networking; and theory.

## Undergraduate program

The undergraduate computer science programis designed to provide students with the educational backg round required for a professional career in the computing industry and for further study at the graduate level. The programincludes a core of required courses and an elective programof courses over a wide range of topics. Seniors work in teams to carry out community-based projects during the two-term capstone course in software engineering.
The computer science curriculumat Portland State University is accredited by the Computing Accreditation Commission of ABET, 111 Market Place, Suite 1050,

Baltimore, MD 21202-4012 - Telephone: (410) 347-7700. This national org anization sets standards for computer science education defined in terms of curricular content, quality of faculty, and adequacy of facilities.

## DEGREE MAPS AND LEARNING OUTCOMES

To view the degree maps and expected learning outcomes for ComputerScience's undergraduate degrees, go to www.pdx.edu/academic-programs/a-z.

## PROGRAM OBJECTIVES

The objectives of the undergraduate programin computer science are to produce graduates with:

- a thorough understanding of and ability to apply the core principles and practices of computing;
- the professional skills to meet the immediate needs of regional and other employers, while being able to adapt to rapidly changing technology;
- a foundation in the supporting areas of communication, science, and mathematics;
- an understanding of ethical responsibilities in the social context in which their contributions occur;
- the motivation and preparation to engage in life-long learning, including entering advanced degree programs in computer science.


## ADMISSION REQUIREMENTS

Students who are intending to graduate with an undergraduate degree in Computer Science must be admitted to Portland State University and complete an optin for the Computer Science major after satisfying the lower-division requirements described below. Students with questions should contact the Computer Science Department. No more than 8 upper-division CS course credits (including any approved upper-divis ion transfer credits) taken prior to admission to the programwill be counted toward the student's departmental requirement of upper-division CS courses. Students also must be in admitted status during the term they intend to graduate.

## Computer Science Admission Requirements

Applies to students pursuing a B.S. in ComputerScience wishing to enroll in upper-division CS courses for the 2022-23 academic year.
Computer Science Department website:
www.pdx.edu/computer-science

## Terms of Admission \& Deadlines

- Completing an opt-in for admis sion to the Computer Science major requires a copy of the student's DARS report, showing that they have passed all of the courses that are required for admis sion.
- Although there are no formaldeadlines, students are strongly encouraged to complete the opt-in as soon as possible in the termafter they have satisfied the admission requirements, so as to avoid delays in being able to reg ister for upper-division CS courses for the following term.
- Beginning in September 2022, the opt-in will be available from the Computer Science Department website at www.pdx.edu/computer-science/undergraduate-admission.
- A detailed four-year course plan/sample schedule is provided by the "Computer Science Blue Sheet", which is available from the Computer Science Department website.


## Requirements for Admission to the Computer Science Major

1. Completion of each of the following core CS courses with a $C$ or better.

- CS 161 Introduction to Programming and Problem Solving (4) (This requirement will be waived for students who have completed CS 162 prior to Fall 2022)
- CS 162 Intro to Computer Science (4)
- CS 163 Data Structures (4)
- CS 201 Computer Systems Programming (4)
- CS 250 Discrete Structures I (4)
- CS 251 Discrete Structures II(4)

2. Completion of each of the following non-CS courses with a grade of $C$ - or better.

- MTH251 Calculus I
- MTH 252 Calculus II
- MTH253 Calculus III or MTH261 Linear Algebra
- Approved 3-termLab Science Sequence


## 3. PSU students must have completed the Freshman and Sophomore Inquiry series with a grade of $C$ - or better. Transfer students must complete the Maseeh College lower division general education requirements.

## Appeals

- Students denied admis sion to the Computer Science programmay submit a written appealusing the official Computer Science Appeals Form, which will then be reviewed by the department's Appeals Committee. All decisions are final.


## Priority Registration

- Most applicants will have completed 90 credits by the time they complete the opt-in. This gives them regis tration priority over students that have completed less than 90 credits. Students who complete the opt-in with less than 90 credits may find classes are full by the time they are able to register. The Computer Science Department is unable to provideoverrides to allow earlier regis tration.


## Pass/No Pass

- All required classes must be taken for a grade (not $\mathrm{P} / \mathrm{NP}$ ) unless they are only offered as P/NP.
- There is no GPA penalty for a Pass or No Pass (but the studentmay be required to retake theclass for a letter grade).


## Additional Information (exceptions, preferences, etc.)

- No preference is given toPSU students versus students who completed required courses elsewhere.


## Continuation Criteria

- Admitted CS undergraduatestudents who are not making acceptable progress towards their degree requirements will be dropped from the programand required to reapply for admis sion. Acceptable progress is defined as completion of at least eight credits of coursework with acceptable grades (Cor better for required CS courses, C - or better for required non-CS courses), satisfying departmental requirements, over the preceding academic year. Readmission will be determined by theCS Undergraduate Committee.


## Prerequisite Policy

- In order to enroll in most upper-division or graduate CS courses, students must be admitted to the Computer Science programor have the instructor's permis sion. Before enrolling in any CS course, students should read the course descriptions and ensure that they have completed all prerequisites with a C or better for
undergraduate courses, or a B or better for graduate courses. Students who have not met this requirement or who do not meet applicable admis sion requirements may be adminis tratively dropped from the course.
- A limited set of upper division CS courses, designated "dualuse courses", may be taken priorto admission, subject to completion of the associated prerequisites. Students should not take a total of more than 8 credits of upperdivision CS courses, including any dual use courses, before they have been admitted to the CS major. To avoid a gap in available courses that could delay progress to graduation, students should not generally take dual use courses before they have completed the admis sion requirements. Students are strongly encouraged to consult the CS Department website, or to meet with an advis or, for further details.


## Laptop Requirement

- Beginning in Fall 2021, students registering for upperdivision (300- or above) CS courses, must have access to a laptop with wireles s Internet access meeting a set of minimum requirements. These minimum requirements can be found on the computer science website at https://www.pdx.edu/computerscience/laptop. Chromebooks, iPads, and similar devices do not meet the requirements torun many applications that may be used in various CS courses.


## Department Communication

- Academic year 2023-24 admis sion requirements are available the preceding academic year's spring term (Spring 2023).


## COMPUTER SCIENCE B.S.

Majors in computer science must complete the following University and departmental degree requirements.

1. All computer science courses used to satisfy the departmental major must be graded Cor better. Courses taken outside the department as part of departmental requirements must be graded C-or better. If a course is offered only on a Pas s/NoPass (P/NP) grading scale, it must be graded as a Pass.
2. All courses specifically required by the department must be taken for a letter grade unless a required course is only offered with a Pass/No Pass option.
3. Afteradmiss ion to the computer science program, students are required to complete a minimum of 44 upper-division computer science credits in residence at PSU.
4. Freshmen entering with 29 or fewer prior university/college credits must complete allUniversity

Studies requirements, including freshman and sophomore inquiry sequences and upper-division cluster courses.
5. Transfer students must have a minimum of 39 credits of University Studies courses and/or arts and letters/social science courses prior to graduation; 12 of these credits are upper-division cluster courses that must be taken at PSU. Transfer students should consult with the CS departmental adviser for more information.

The following is a sample curriculum. Students choosing to make modifications to this schedule are urged to consult with an adviser.

## REQUIREMENTS

| Freshman year |  |  |
| :--- | :--- | ---: |
| CS 161 | Introduction to Programming and | 4 |
|  | Problem-Solving |  |
| CS 162 | Introduction to Computer | 4 |
|  | Science |  |
| Mth 251 | Calculus I | 4 |
| Mth 252 | Calculus II | 4 |
|  |  |  |
|  | Approved Laboratory Science | 15 |
|  | Freshman Inquiry | 15 |

Subtotal: 46
Sophomore year

| CS 163 | Data Structures | 4 |
| :--- | :--- | ---: |
| CS 201 | ComputerSystems Programming | 4 |
| CS 250 | Discrete Structures I | 4 |
| CS 251 | Discrete Structures II | 4 |
| Mth 253 | Calculus III | 4 |
|  | or |  |
| Mth 261 | Introductionto Linear Algebra | 4 |
|  |  | 8 |
|  | Sophomore Inquiry | 8 |
|  | Free electives | 16 |

Subtotal: 44

| Junior year <br> CS 302 | Programming Methodologies and <br> CS 314 | Software Implementation <br> Elements of Software |
| :--- | :--- | :---: |
| CS 333 | Engineering | 4 |
| CS 350 | Introductionto Operating <br> Systems | 4 |
|  | Algorithms and Complexity <br> Introductionto Database | 4 |
|  | Management Systems <br> Approvedupper-division <br> programming intensiveCS <br> elective | 4 |
| Wr 227 | Introductionto Computer | 4 |
|  | Hardware <br> Introductory Technical Writing | 4 |


|  | Upper-division cluster | 12 |
| :--- | :--- | :--- |
|  |  | Subtotal: $\mathbf{4 4}$ |
| Senior year <br> CS 305 | Social, Ethical, and Legal <br> Implications of Computing | 2 |
| CS 358 | Principles of Programming | 4 |
|  | Languages |  |
| CS 469 | Software Engineering Capstone I | 3 |
| CS 470 | Software Engineering Capstone | 3 |
|  | II |  |
|  | Approved upper-division | 16 |
|  | computer scienceelectives |  |
|  | ApprovedMath electives | 7 |
|  | Approved Science elective | 4 |
|  | Free electives |  |

Subtotal: 46
Note: The University requires all students to have a minimum of 62 upper-divis ion credits to graduate. Since fewer than 62 upper-division credits are required in computer science, mathematics, and general education for the computer science major, the extra credits of upperdivision work must be taken fromeither the approved math or scienceelectives, or the free electives.

## UPPER DIVISION CREDITS

| Approved upper-division Computer Science electives |  |  |
| :--- | :--- | :--- |
| The total may include any regular 300-and 400-level |  |  |
| computer science course, and any of the courses: |  |  |
| ECE 485 | Microprocessor Sy stemDesign | 4 |
| ECE 486 | Computer Architecture | 4 |
| except that no more than a total of 4 credits may be |  |  |
| taken from: |  |  |
| CS 401 | Research | $1-6$ |
| CS 405 | Reading and Conference | $1-6$ |
| CS 406 | SpecialProjects | $1-6$ |
| CS 407 | Seminar | $1-6$ |
| CS 409 | Practicum | $1-9$ |

At least 4 credits of approved "Programming Intensive" courses must be taken. Thesecourses can be identified by the "P" suffixin the course number (e.g., CS 410P, CS 465P, CS 494P, etc.). Additionally, CS 404, University Studies courses, and courses specifically described as not being applicable to the CS degree may not be used.

## Approved Laboratory Science

Students must select one of the following 15 credit sequences, including their as sociated laboratories:

## Sequence 1:

Ph 211 General Physics (with Calculus) 4
Ph 212 General Physics (with Calculus)

II

| Ph 213 | General Physics (with Calculus) III | 4 | Stat 451 | Applied Statistics for Engineers and Scientists I | 4 |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | With |  | Stat 452 | Applied Statistics for Engineers | 3 |
| Ph 214 | Lab for Ph 201 or Ph 211 or Ph | 1 |  | and Scientists II |  |
|  | 221 orPh 231 |  | Stat 464 | Applied Regression Analysis | 3 |
| Ph 215 | Lab for Ph 202 or Ph 212 or Ph | 1 | Stat 467 | Applied Probability I | 3 |
|  | 222 orPh 232 |  | Stat 468 | Applied Probability II | 3 |
| Ph 216 | Lab for Ph 203 or Ph 213 or Ph 223 orPh 233 | 1 | Other upper-division mathematics or statistics courses may be used to satisfy the requirement with prior written |  |  |
| Sequence 2: |  |  | approval f | he Computer Science Undergraduat |  |
| Ch 221 | General Chemistry I | 4 | Adviser. |  |  |
| Ch 222 | General Chemistry II | 4 |  |  |  |
| Ch 223 | General Chemistry III | 4 | COMPUTER SCIENCE MINOR |  |  |
|  | With |  |  |  |  |
| Ch 227 | General Chemistry Laboratory | 1 | A minor in computer science is available within the Maseeh College of Engineering and Computer Science in the area of computerscience. |  |  |
| Ch 228 | General Chemistry Laboratory | 1 |  |  |  |
| Ch 229 | General Chemistry Laboratory | 1 |  |  |  |
| Sequence 3: Bi 211 |  |  | REQUIREMENTS |  |  |
|  | Principles of Biology: Biology of Cells | 4 | To earn a minor in computer science, a student must complete 24 credits as follows: |  |  |
| Bi 212 | Principles of Biology: The | 4 |  |  |  |
|  | biology of organis ms |  | Courses |  |  |
| Bi 213 | Principles of Biology: Evolution and ecology of living organisms | 4 | CS 161 | Introduction to Programming and Problem-Solving | 4 |
| Bi 214 | Principles of Biology Lab I | 1 | CS 162 | Introduction to Computer | 4 |
| Bi 215 | Principles of Biology Lab II | 1 |  | Science |  |
| Bi 216 | Principles of Biology Lab III | 1 | CS 163 | Data Structures | 4 |
| Approved Scienceelectives |  |  | $\begin{aligned} & \text { CS } 201 \\ & \text { CS } 250 \end{aligned}$ | ComputerSystems Programming | 4 |
|  |  |  | Discrete Structures I | 4 |
| Students must complete additional credits of Approved |  |  |  | ApprovedCS Minor course |  |  |
| Science electives chosen fromBiology, Chemistry, |  |  |  |  |  |  |  |
| Physics, Geology, or Environmental Science. A total of at |  |  |  |  |  |
| least 19 credits of Approved Laboratory Science and Approved Science electives mustbe taken. |  |  | Only grades of Cor better count toward departmental requirements. At least 12 of the required 24 credits must be taken at Portland State University. |  |  |
| Approved Mathematics electives |  |  |  |  |  |  |  |  |
| Students must complete 7 or more credits of approved mathematics electives. The current list of approved courses includes: |  |  | ApprovedCS Minor courses include any lower-division or upper-division Computer Science course. Some upperdivision courses are reserved for Computer Science majors and may require permis sion from the instructor in order to |  |  |
| Mth 261 | Introduction to Linear Algebra | 4 |  |  |  |  |  |  |
| Mth 311 | Introduction to Mathematical | 4 | and may require permis sion from the instructor in order to register. <br> Subtotal: 24 |  |  |
|  | Analysis I |  |  |  |  |  |  |  |
| Mth 343 | Applied Linear Algebra | 4 |  |  |  |
| Mth 344 | Introduction to Group Theory | 4 | COMPUTER SCIENCE - HONORS TRACK |  |  |
| Mth 346 | and Applications Number Theory |  | The honors degree in computer science requires the writing |  |  |
| Mth 356 | Discrete Mathematics | 4 | of an honors thesis. Details about the programcan be found on the computer science website at https://www.pdx.edu/computer-science/honors-track. |  |  |
| Mth 457 | The Mathematical Theory of Games I | 3 | found on the computer science website at https://www.pdx.edu/computer-science/honors-track. |  |  |
| Mth 458 | The Mathematical Theory of | 3 |  |  |  |
|  | Games II |  | BIOMEDICAL INFORMATICS PROGRAM |  |  |
| Mth 461 | Graph Theory I | 3 |  |  |  |
| Mth 462 | Graph Theory II | 3 | Portland S | University and Oregon Health \& Sci |  |
| Stat 366 | Introduction to Experimental Design | 4 | University programi | r an accelerated, collaborative degre medicalinformatics. Designed forh |  |

achieving freshmen, this programcombines courses from both schools to award a B.S. in computer science and Master of Biomedical Informatics at theend of five years. Details about the programcan be found on the computer science website at https://www.pdx.edu/computer-science/biomedical-informatics.

## Graduate Programs

## ADMISSIONS REQUIREMENTS

To be considered for admission to the graduate programin computer science, the student must have a four-year baccalaureate degree froman accredited institution. Prospective graduate students are not required to have a bachelor's degree in Computer Science, but they must make up the backg round needed for graduate study before applying for admis sion. The Grad Prep programdescribed at https://www.pdx.edu/computer-science/grad-prep may be helpfulin developing knowledge of the core curriculum of an undergraduate computer science degree.

An undergraduate GPA of at least 3.00 in upper-division is required. Note thatthe department has waived its requirement for the Graduate Record Examination (GRE) through fall 2023. Applicants must submit two references, transcripts, and a statement of purpose to the department.

Normally, an applicant to the Ph.D. program will have an M.S. in computer science. Students may apply to the M.S. programand later apply to the Ph.D. program. Students with a bachelor's degree may apply directly to the Ph.D. program.

## COMPUTER SCIENCE M.S.

The Master's programin computer science is designed to prepare students for advanced careers in the computer industry, to create a research environment in computer science, and to prepare students for graduate work at the Ph.D. level.

See University Master's degree requirements. The Master's program in computer science consis ts of two options. The first option involves the completion of an approved programof 45 credits. The second option requires the completion of an approved programof 45 credits, which includes 6 to 9 credits of thesis. In both options, the coursework includes core courses in theory and programming practice, plus a 9 -credit concentration in one of the areas listed on the computer science departmental web site. For the thesis option, successful completion of a final oral examination covering the thesis is required. For more information, visit: https://www.pdx.edu/computer-science/master.

## THEORY REQUIREMENT

One theory course from:
CS 581 Theory of Computation 3
CS 584 AlgorithmDesign and Analysis 3
CS 578 Programming Language 3
Subtotal: 3

## PRACTICE REQUIREMENT

One programming practice course from: CS 558

Programming Languages
Or any 500-level course designated by the department as a
"Programming Intensive" course, as indicated by the "P" suffix in the corres ponding 400-level course number. Subtotal: 3

## ELECTIVES

Students must take enough electives to complete 45 total credits for the Master's degree. Electives can be any 500levelCS course and may include up to 6 credits of CS 505 (Reading and Conference) and CS 506 (Special Projects). CS 501 Research, CS 502 Independent Study, CS 504 Internship, andCS 509 Practicumcredits cannot be applied. A limited number of credits taken outside Computer Science can count towards the elective requirements, with advisor approval. A minimum of 30 credits must be taken in Computer Science at Portland State University. Given this, students may use a combined total of 15 pre-admission, transfer, and non-CS credits toward their Master's degree with advisor approval. Students may use credits froma combination of these three categories, but if the total exceeds the 15 credit limit, then the exces s credits will not be counted towards the degree.

- Pre-admission credits (taken before the termof formal admis sion) can include both transfer and PSU credits. Pre-admission credits taken at PSU are requested via a DARS exception submitted to the Graduate School. This request should be made soon after admis sion to the graduate program.
- Transfercredits refer to credits taken fromanother institution other than PSU. To request approval of transfercredits, complete and submit the GO-21M form (Proposed Transfer Credit) to the CS Graduate Advisor. Students should submit the GO-21 form during the first term of enrollment in the program, so there is sufficient time to complete any additional coursework that may be neces sary. Any transfer credits must be approved before graduation paperwork can be processed. OHSU joint campus credits are considered transfer credits and are transferred via a different process. For more information, visit: www.pdx.edu/gradschool/joint-campus-regis tration.
- Non-CS credits taken outside of Computer Science, such as ECE or Math, can count towards elective
requirements once approved. Students should obtain advisor approval in advance to avoid the risk of taking a coursethat will not be approved. To request approval, submit a plan of study with the courses lis ted to the Graduate Advisor. Non-CS courses must be graduate level. Note that only one ETM course will count towards the elective requirements. All ETM courses are eligible to transfer but students are limited to using only one for the CS degree requirements. Subtotal: 30


## TRACK REQUIREMENT

Take three courses fromone of the following tracks:

## Databases

Covers concepts, languages, implementation and application of database managementsystems. Other topics that have been offered in the track include formal foundations of databases, databases for cloud and cluster environments, and datas treams ystems.
CS 586 Introduction to Database
Management Systems

And two courses from the following*:

| CS 530 | Internet, Web, \& Cloud Systems | 3 |
| :---: | :---: | :---: |
| CS 587 | Database ManagementSystems Implementation | 3 |
| CS 588 | Cloud and Cluster Data <br> Management | 3 |
| CS 589 | Blockchain Development \& Security | 3 |
| *Or any <br> Languag | edCS 510 coursein Databases. <br> Programming |  |

Focuses on the design, implementation, and use of programming languages. It includes exposure to a variety of programming paradigms, experienceusing programming languages to express the essential abstractions of a problemdomain, courses on programming language implementation, and the study of formal methods for specifying and reasoning about programs and programming languages.
CS 558 Programming Languages

Two courses fromthe following*:
CS 515 Parallel Programming
CS $520 \quad$ Object-Oriented Programming \& Design
CS 553 Design Patterns
CS 557 Functional Programming 3
CS 578 Programming Language Semantics
*Or any approved CS 510 course in Languages and Programming.

## Security

Focuses on protecting computing systems anduser data from unauthorized access and use. Topics include cryptography, network and host-based access control, vulnerability analysis, penetration testing, and reverse engineering.
CS 591 Introduction to Computer Security

Two courses fromthe following*:

| CS 576 | Computer Security Research <br> Seminar | 3 |
| :--- | :--- | :--- |
| CS 585 | Cryptography | 3 |
| CS 592 | Malware Reverse Engineering | 3 |
| CS 593 | Digital Forensics | 3 |
| CS 595 | Web and Cloud Security | 3 |
| CS 596 | Network Security | 3 |
| *Or any approved CS 510 coursein Security. |  |  |
| Software Engineering |  |  |

Studies theprinciples, processes, techniques, and tools for building software systems. Topics include software requirement, design, development, validation, and maintenance.
CS 554 Software Engineering

Two courses fromthe following*:

CS $552 \quad$| Building Software Systems with |
| :--- |
| Components |

CS 553 Design Patterns 3
CS 555 Software Specificationand 3
Verification
CS 556 Software Implementation and
Testing
Open Source Software
DevelopmentLaboratory
*Or any approved CS 510 course in Software Engineering.

## Systems andNetworking

Studies the design and implementation of operating systems, wired and wireless computer networks including high performance computers ystems, data centers, cloud computing architectures, dis tributed systems, fault tolerance, concurrency, systems programming, and theoretical topics related to these areas.
CS 533 Concepts of Operating Systems 3
CS 594 Internetworking Protocols 3

One course fromthe following*:
CS 515 Parallel Programming 3
CS 538 Computer Architecture 3
CS 572 Operating SystemInternals 3

Introduction to W ireless Network Protocols
*Or any approved CS 510 course in Systems and Networking.

## Artificial Intelligence andMachine Learning

Covers modern algorithms underlying intelligent and learning systems. Examples of topics covered in this track include knowledge representation, planning, reasoning, combinatorial and adversarial search methods, natural language processing, computer vision, statistical machine learning, and evolutionary and reinforcement learning.

| CS 541 | Artificial Intelligence | 3 |
| :--- | :--- | :--- |
| CS 545 | Machine Learning | 3 |

One course from the following*:
CS 542 Advanced Artificial Intelligence: $\begin{aligned} & \text { Combinatorial Games }\end{aligned}$
CS 543 Advanced Artificial Intelligence: 3 Combinatorial Search
CS 546 Advanced Topics in Machine
CS 570 Machine Learning Seminar 1
Stat 671 StatisticalLearning I 3
Stat 672 StatisticalLearning II 3
Stat 673 StatisticalLearning III 3
*Or any approved CS 510 coursein Artificial Intelligence or Machine Learning.
Subtotal: 9

## Total Credit Hours: 45

## Cumulative Graduate GPA

Students must have a graduate GPA of 3.0 or above in all graduate level coursework taken at PSU to graduate froma master's degree, doctoral degree, or graduate certificate programat PSU.

## Degree Program GPA

Students must have a GPA of 3.0 or above in all courses being used to meet the degree requirements. All graded courses must be passed with a grade of B- or better. All courses taken Pass/No Pass must be passed. Students must have the minimum number of credits needed for their degree before you can graduate.

## Application for Graduation

Students must apply for graduation no later than the first Friday of the term in which they wish to graduate. The application for graduation can be found at:
http://www.pdx.edu/ogs/forms
COMPUTER SCIENCE PH.D.

The doctoraldegree programin Computer Science is designed to prepare students for advanced research or univers ity teaching in the field.
See Univers ity doctoral degree requirements. The student must complete an approved programof 90 graduate credits, including 18 credits of core courses and 27 credits of dis sertation research. To be admitted to Ph.D. candidacy, a student must pass the Research Proficiency Examination (RPE) and must present an acceptable dissertation proposal. The dissertation comprises original research work, which is expected to be of a quality meriting publication in a refereed journal or conference. For more information, visit: www.pdx.edu/computer-science/doctor-philosophy-phd.

## CYBERSECURITY GRADUATE CERTIFICATE

The cybersecurity certificate programrequires admis sion as a graduate student, similar to admission to the Master's program, in the Computer Science department. The programrequires 21 total credits of graduate classes. There are two core clas ses for a total of 6 credits. In addition, five elective classes mustbe taken for the needed additional 15 credits. In summary, seven total graduate classes must be taken, two are core and five are electives.

| Required Core Courses |  |  |
| :---: | :--- | :---: |
| CS 591 | Introduction to Computer | 3 |
|  | Security |  |
| CS 595 | Web and Cloud Security | 3 |
| Subtotal: 6 |  |  |

Five of the following courses*:
CS 554 Software Engineering 3
CS 555 Software Specification and 3
Verification
CS 556 Software Implementation and 3
CS 576 Computer Security Research 3
CS 585 Cryptography 3
CS 592 Malware Reverse Engineering 3
CS 593 Digital Forensics 3
CS 594 Internetworking Protocols 3
CS 596 Network Security 3

* Or any CS 510 course in Security.

Subtotal: 15

## Total Credit Hours: 21

## Electrical and Computer Engineering

1900 SW Fourth Ave., Suite 160
503-725-3806
www.pdx.edu/electrical-computer-engineering/

- B.S.-Computer Engineering
- B.S.-Electrical Engineering
- Minor in Electrical Engineering
- M.S.-Electrical and Computer Engineering
- Ph.D.-Electrical and Computer Engineering


## Mission, Vision \& Values

## Mission

We prepare students for successfulengineering careers and lifelong learning, and we conduct research that creates new technologies and engineering knowledge.

## Vision

Our vision is to be a source of premier electrical and computer engineering talent and high-impact research. This means our graduates are successful, our research is recognized worldwide, and we are the intellectual center for our discipline in the Portland region.

## Values

## We value

- The success of our graduates
- Contributions to research and knowledge creation
- High intellectual and ethical standards
- High quality education for traditional and nontraditional students
- A diverse student population
- Our contribution to the Oregon economy
- Lifelong learning
- Technical and professional relationships with the engineering community


## Undergraduate programs

The Department of Electrical and Computer Engineering offers programs in electrical and computer en gineering. Cooperative educational arrangements with Portland-area industries, government agencies, and engineering consulting offices are available to qualified students. Qualified freshmen are encouraged to participate in the University Honors Program. Qualified upper-division students should consider the Electrical and Computer Engineering departmentalhonors track as described below.
The electricalengineering and computer engineering programs at Portland State University are accredited by the Engineering Accreditation Commission of ABET, 111
Market Place, Suite 1050, Baltimore, MD21202-4012 -
Telephone: (410) 347-7700.

DEGREE MAPS AND LEARNING OUTCOMES
To view the degree maps and expected learning outcomes for Electrical and Computer Engineering's undergraduate degrees, go to www.pdx.edu/academic-programs/a-z.

## PROGRAM EDUCATIONAL OBJECTIVES

The electrical and computer engineering programs prepare our graduates for the following programeducational objectives:

1. Graduates are expected to beemployed as electrical or computer engineers or in related fields that benefit from an electrical and computer engineering education.
2. Graduates are expected to advance in their profession and engage in the professional community.
3. Graduates are expected to continue to learn and adapt in a world of constantly changing environment and technology.

## ADMISSION REQUIREMENTS

## ECE Admission Requirements

Forstudents gaining 300-levelECE course admis sion FALL 2021

## Terms of Admission \& Deadlines

Before students can begin taking 300 levelECE courses, they must be admitted to the programand satisfy the course prerequisites.

- The application deadline for admis sion to the program during fall term is April 15.
- If you are not a current PSU student, please apply to PSU before you apply for admis sion to our program.
- The application for our programis on the department web site.


## Application Requirements

Only students who meet the following requirements by April 15 are eligible to apply for admission to our electrical engineering or computer engineering programs:

- Completed at least sixof the following courses:
- Mth 251, Mth 252
- Ph 211 or Ph 221, Ph 214
- ECE 102, ECE 103, ECE 171, ECE 221
- Selective GPA of at least 2.25
- Received a letter grade of Cor above in every course required for the degree


## Application Recommendations

We recommend that students complete the following courses before applying for admis sion:

- Mth 256, Mth 261
- Ch 221, Ch 227
- Ph 212 or Ph 222, Ph 215
- ECE 101, ECE 172, ECE 222
- Freshman Inquiry or Wr 121 and Comm 220 for transfer students


## Selective GPA Calculation

- The selective GPA is calculated fromall lower and upperdivision math, science, computer science, and engineering courses that are required for one of our undergraduate degree programs and that have been completed with a letter grade by the time of application. See the PSU Bulletin for a list of courses required for our undergraduate degree programs.
- If a student retakes a course in which they received a grade lower than a C -, the as signed grade during the first time they took the course will be excluded from the calculation. The grades in all subsequent attempts will be included in the calculation.


## Admission Criteria and Process

- All students who have a selective GPA of 3.0 or higher will be admitted.
- Students who meet our admis sion requirements but have a selective GPA below 3.0 will be considered for admis sion by a committee. The committee considers each student's academic record, life experience, recent academic performance in engineering courses, extenuating circumstances, and leadership qualities.
- We do not give preference to any group of students. Students with transfer credits are treated the same as students who complete their courses at PSU.


## ELIGIBILITY

To be eligible for admission, each student should meet the following minimum requirements:

1. Complete, with a minimum grade of $\mathbf{C}$ and a minimum GPA of $\mathbf{2 . 2 5}$, a designatedset of courses for each program as follows:

## Hectrical Engineering:

The engineering core consisting of:

| Ch 221 | General Chemistry I | 4 |
| :--- | :--- | :--- |
| Ch 227 101 | General Chemistry Laboratory | 1 |
| ECE 101 | Exploring Electrical Engineering | 4 |
| ECE 102 | Engineering Computation | 4 |

ECE 103
ECE 171
ECE 172
ECE 221
ECE 222
ECE 223
Mth 251
Mth 252
Mth 253
Mth 254
Mth 256
Mth 261
Ph 221
Ph 222
Ph 223
Ph 214
Ph 215
Ph 216

Engineering Programming
Digital Circuits
Digital Systems
Electric Circuit Analysis I

Equations
Introduction to Linear Algebra 4
General Physics (with Calculus) 3
I
General Physics (with Calculus) 3
II
General Physics (with Calculus)
III
Lab for Ph 201 or Ph 211 or Ph
221 or Ph 231
Lab for Ph 202 or Ph 212 or Ph
222 or Ph 232
Lab for Ph 203 or Ph 213 or Ph
223 or Ph 233
Freshman Inquiry
Ph 211, Ph 212 , and Ph 213 also accepted for $\mathrm{Ph} 221, \mathrm{Ph}$ 222, and Ph 223
Freshman Inquiry: Comm 220, and Wr 121 for transfer students

## Computer Engineering:

Ch 221
General Chemistry I
Ch 227 General Chemistry Laboratory
ECE 101 Exploring Electrical Engineering 4
ECE 102 Engineering Computation
ECE 103 Engineering Programming
ECE 171 Digital Circuits
ECE 172 Digital Systems
ECE 221 Electric Circuit Analysis I
ECE 222 Electric Circuit Analysis II
ECE 223 Electric Circuit Analysis III
Mth 251 Calculus I
Mth 252 Calculus II
Mth 253 Calculus III
Mth 256 Applied Ordinary Differential Equations
Mth 261 Introduction to Linear Algebra
Ph 221 General Physics (with Calculus)
Ph 22 I
General Physics (with Calculus) 3
Ph 223

II
General Physics (with Calculus) 3

Ph 214
Lab for Ph 201 or Ph 211 or Ph 221 or Ph 231
Ph 215
Lab for Ph 202 or Ph 212 or Ph
222 orPh 232
Ph 216
Lab for Ph 203 or Ph 213 or Ph
223 orPh 233
Freshman Inquiry
Ph 211, Ph 212 , and Ph 213 also accepted for Ph 221 , Ph 222, and Ph 223

Freshman Inquiry: Comm 220, and Wr 121 for transfer students

## 2. Have a minimum technical GPA of $\mathbf{2 . 2 5}$

(Technical GPA is based on an average of all major-related classes taken prior to admis sion).

## Continuation Criteria

After admis sion to the Electrical Engineering or Computer Engineering undergraduate program, students will be expected to:

1. Maintain a cumulative major GPA of 2.00 or higher;
2. Attain a grade of Corbetter in all required lower division courses;
3. Attain a grade of Corbetter in all required upper divis ion courses (numbered 300 or higher) within two attempts foreach course;
4. Receive no more than one student code of conduct violation.

## Appeals

Students denied admis sion to or su spended fromthe degree programmay requestreconsideration by submitting a petition. The petition and supporting materials will be reviewed by the Electrical and Computer Engineering Undergraduate Committee. The appeal must be made within 30 days of notice to thestudent of denial of admis sion or suspension.

## Pass/No Pass Grading Policy

All courses specifically required by the University or by the Electrical Engineering and ComputerEngineering programs must be taken for a letter grade unless a required course is only offered with a pass/no pass option.

## DEGREE REQUIREMENTS

## General Education requirements

The MCECS General Education requirements for engineering students can be met in one of the following ways:

1. Students who complete their entire programat Portland State University meet the requirement by taking 39 credits of University Studies. ( 15 credits Freshmen Inquiry, 12 credits Sophomore Inquiry, and 12 credits Upper-division Cluster.)
2. Transferstudents meet the requirement by having Wr 121, Comm 220, and 39 credits as a combination of University Studies courses and liberal arts/social science transfercredits. (At a minimum the 12 credit upper-division cluster must be taken at PSU. Please contactECE departmental adviser for details of this requirement.)
3. Courses specifically required in a programmust be taken on a graded basis unless those classes are only available with a pass/no-pass grading option. Clas ses not specifically identified by a unique number, for example an upper-division cluster class, may be taken on a P/NP basis.

## GPA requirements

In order to graduate, electrical engineering and computer engineering students must have an overallGPA, which includes all courses taken at PSU, greater than 2.00. Their major GPA must be greater than 2.00. Major GPA includes all of the engineering courses used toward satisfying the degree requirements, whether taken at PSU or transferred. Normal PSU policies apply for grade replacement in major GPA calculation. If at any point either of these GPAs falls below 2.00 students will be placed on probation, as explained in the Continuation Criteria section above.

## ELECTRICAL ENGINEERING B.S.

## REQUIREMENTS

The Electrical Engineering programis accredited by the Engineering Accreditation Commis sion of ABET, 111 Market Place, Suite 1050, Baltimore, MD21202-4012 telephone: (410) 347-7700. It is designed to providea comprehensive background in the electrical sciences and offers an opportunity for specialization in the areas of analog/RFcircuits, digital/VLSI design, electromagnetics, microelectronics, power engineering, and signal processing. This programprovides the student with the educational backg round necessary foremployment in virtually all electrical engineering fields. Majors in electrical engineering mustcomplete the following University and departmental degree requirements. Any deviation fromthe required courses mustbe approved by the department.
Freshman year
ECE 101 Exploring Electrical Engineering 4
ECE 102 Engineering Computation 4
ECE 103 Engineering Programming 4
ECE 171 Digital Circuits 4
ECE 172 Digital Systems 4

| Mth 251 | Calculus I | 4 |
| :---: | :---: | :---: |
| Mth 252 | Calculus II | 4 |
| Mth 253 | Calculus III | 4 |
| Ch 221 | General Chemistry I | 4 |
| Ch 227 | General Chemistry Laboratory | 1 |
|  | Freshman Inquiry | 15 |
| Subtotal: 52 |  |  |
| Sophomore year |  |  |
| ECE 211 | Introductionto Design Processes | 1 |
| ECE 212 | Introductionto Project | 2 |
|  | Development |  |
| ECE 221 | Electric Circuit Analysis I | 4 |
| ECE 222 | Electric Circuit Analysis II | 4 |
| ECE 223 | Electric Circuit Analysis III | 4 |
| Mth 254 | Calculus IV | 4 |
| Mth 256 | Applied Ordinary Differential | 4 |
|  | Equations |  |
| Mth 261 | Introduction to Linear Algebra | 4 |
| Ph 221 | General Physics (with Calculus) | 3 |
|  | I |  |
| Ph 222 | General Physics (with Calculus) | 3 |
|  | II |  |
| Ph 223 | General Physics (with Calculus) | 3 |
|  | III |  |
| Ph 214 | Lab for Ph 201 or Ph 211 or Ph | 1 |
|  | 221 orPh 231 |  |
| Ph 215 | Lab forPh 202 or Ph 212 or Ph | 1 |
|  | 222 orPh 232 |  |
| Ph 216 | Lab forPh 203 or Ph 213 or Ph | 1 |
|  | 223 orPh 233 |  |
|  | Sophomore Inquiry | 8 |
|  | Subtotal: 47 |  |
| Junior year |  |  |
| ECE 315 | Signals and Systems I | 4 |
| ECE 316 | Signals and Systems II | 4 |
| ECE 317 | Feedback and Control Systems | 4 |
| ECE 321 | Electronics I | 4 |
| ECE 322 | Electronics II | 4 |
| ECE 331 | Engineering Electromagnetics I | 4 |
| ECE 332 | Engineering Electromagnetics II | 4 |
| EE 347 | Power Systems I | 4 |
| ECE 371 | Microprocessors | 4 |
| Stat 351 | Probability and Statistics for | 4 |
|  | Electrical and Computer |  |
|  | Engineering |  |
|  | Junior ECE elective | 4 |

Subtotal: 44
Junior-levelECE elective is any ECE or EE course numbered 311 or higher.

## Senior year

| ECE 411 | Industry Design Processes | 2 |
| :--- | :--- | :--- |
| ECE 412 | Senior Project Development I | 4 |
| ECE 413 | Senior Project Development II | 2 |

ECE 424 Engineering Professional 2
Practice
Junior or senior ECE electives 8
SeniorECE electives 4
Upper-division cluster 8
Free electives 3
Ec 314U Private and Public Investment 4
Analysis
Subtotal: 37
Ec 314 U is a required course contained within some upperdivision clusters.

Junior-levelECE elective is any ECE or EE course numbered 311 or higher. One of the junior- or senior-level electives may be a Mth, CS, ME, or Ph course numbered 311 (or 411) and above.

Senior-levelECE electives are any ECE course numbered 400 and above.

## ELECTRICAL ENGINEERING MINOR

A minor programis available within the Maseeh College of Engineering and Computer Science in the area of electrical engineering.

## REQUIREMENTS

A student wishing to minor in this area should complete, with a minimum grade of C , and a minimum GPA of 2.25, a des ignated set of courses as follows:

## Courses

| ECE 101 | Exploring Electrical Engineering | 4 |
| :--- | :--- | :--- |
| ECE 102 | Engineering Computation | 4 |
| ECE 103 | Engineering Programming | 4 |
| ECE 171 | Digital Circuits | 4 |
| ECE 172 | Digital Systems | 4 |
| ECE 221 | Electric Circuit Analysis I | 4 |
| ECE 222 | Electric Circuit Analysis II | 4 |
| ECE 223 | Electric Circuit Analysis III | 4 |

or approved equivalents
At least four lecture courses fromthis list must be taken at Portland State University. Course requirements for the minor also meet partial eligibility requirements for admis sion to the electrical engineering and computer engineering programs. Students who complete the requirements for the minor may wish to apply for admission to one of these programs. Students graduating in computer engineering may not claima minor in electrical engineering. Students planning to minor in electrical engineering should consult with an advisor in the Department of Electrical and Computer Engineering.

COMPUTER ENGINEERING B.S.

The ComputerEngineering programis accredited by the Engineering Accreditation Commission of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012 telephone: (410) 347-7700. It is designed to provide a comprehensive background in computerengineering and offers an opportunity for specialization in the areas of digital electronics, VLSI circuit design and computer aided design, robotics, computer architecture, communication systems, andembedded microprocessor systemdesign. This programprovides the student with theeducational background necessary for employment in virtually all branches of the digitalelectronics and computer industry. Majors in computer engineering mustcomplete the following University and departmental degree requirements. Any deviation from the required courses must be approved by the department.

## REQUIREMENTS

| Freshman year |  |  |
| :---: | :---: | :---: |
| ECE 101 | Exploring Electrical Engineering | 4 |
| ECE 102 | Engineering Computation | 4 |
| ECE 103 | Engineering Programming | 4 |
| ECE 171 | Digital Circuits | 4 |
| ECE 172 | Digital Systems | 4 |
| Ch 221 | General Chemistry I | 4 |
| Ch 227 | General Chemistry Laboratory | 1 |
| Mth 251 | Calculus I | 4 |
| Mth 252 | Calculus II | 4 |
| Mth 253 | Calculus III | 4 |
|  | Freshman Inquiry | 15 |
| Subtotal: 52 |  |  |
| Sophomore year |  |  |
| ECE 211 | Introductionto Design Processes | 1 |
| ECE 212 | Introduction to Project | 2 |
|  | Development |  |
| ECE 221 | Electric Circuit Analysis I | 4 |
| ECE 222 | Electric Circuit Analysis II | 4 |
| ECE 223 | Electric Circuit Analysis III | 4 |
| Mth 256 | Applied Ordinary Differential Equations | 4 |
| Mth 261 | Introduction to Linear Algebra | 4 |
| Mth 356 | Discrete Mathematics | 4 |
| Ph 221 | General Physics (with Calculus) | 3 |
|  | I |  |
| Ph 222 | General Physics (with Calculus) | 3 |
|  | II |  |
| Ph 223 | General Physics (with Calculus) | 3 |
|  | III |  |
| Ph 214 | Lab forPh 201 or Ph 211 or Ph | 1 |
|  | 221 orPh 231 |  |
| Ph 215 | Lab for Ph 202 or Ph 212 or Ph | 1 |
|  | 222 orPh 232 |  |
| Ph 216 | Lab forPh 203 or Ph 213 or Ph | 1 |
|  | 223 orPh 233 |  |
|  | Sophomore Inquiry | 8 |

Subtotal: 47

| Junior year |  | 4 |
| :--- | :--- | :--- |
| ECE 315 | Signals and Systems I | 4 |
| ECE 321 | Electronics I | 4 |
| ECE 351 | Verilog and FPGA Design | 4 |
| ECE 361 | Computer SystemOrganization | 4 |
| ECE 362 | Embedded Operating Systems | 4 |
| ECE 371 | Microprocessors |  |
| ECE 372 | Microprocessor Interfacing and <br> ECE 373 | Embedded Systems <br>  <br>  |
| Stat 351 | Device Drivers <br> Probability and Statistics for <br>  <br> Electrical and Computer <br> Engineering <br> Junior ECE electives | 4 |

Subtotal: 46
Junior-levelECE elective is any ECE orEE course numbered 311 or higher.

| Senior year |  |  |
| :--- | :--- | :--- |
| ECE 411 | Industry Design Processes | 2 |
| ECE 412 | SeniorProject Development I | 4 |
| ECE 413 | SeniorProject Development II | 2 |
| ECE 424 | Engineering Professional | 2 |
|  | Practice |  |
| ECE 485 | Microprocessor SystemDesign | 4 |
| ECE 486 | Computer Architecture | 4 |
|  | Junioror senior ECE elective | 4 |
|  | Free elective | 1 |
| Ec 314U | Private and Public Investment | 4 |
|  | Analysis |  |
|  | Upper-division cluster | 8 |

Subtotal: $\mathbf{3 5}$
Ec 314 U is a required course contained within some upperdivision clusters.
Junior-levelECE elective is any ECE orEE course numbered 311 or higher.

The junior- or senior-levelelective may be a Mth, CS, ME, or Ph course numbered 311 (or 411) and above.
Senior-levelECE electives are any ECE course numbered 400 and above.

## ELECTRICAL ENGINEERING AND COMPUTER ENGINEERING HONORS TRACK

The Electrical Eng ineering and Computer Engineering departmental honors tracks permits highly motivated, qualified students to pursue a subject in the field of electrical or computer engineering in greater depth than is normally possible within the undergraduateECE programs. Students who meet honors track requirements will receive special recognition on their diploma.

## Admission Criteria

1. Admis sion to the Electrical or Computer Engineering Programand completion of minimum 90 credit hours of degree required courses.
2. Minimum overall and major GPA of 3.40 .
3. At least three quarters of EE or CMPE degree program study left.

## Application Procedure

Typically, students should apply for admission during the spring quarter of their junior year, but applications will be considered year-round. Students should submit the following:

- ECE Honors Programapplicationform;
- official transcripts of all university work;
- letters of reference fromat least two ECE faculty members; and
- statement of interest indicating reasons for seeking admis sion to the honors program.
After admis sion, student will work with the ECE department to identify the faculty advis or and develop an honors project plan.
Additional graduation requirements:

1. Completion of 6 credits of ECE 403 Honors Thesis with a minimum grade of $B+$ (Note: 4 credits can replace one senior elective.)
2. Approved final written thesis and public presentation.
3. Overall and major GPA greater than 3.40.

More details are available fromthe ECE department.

## FAST TRACK BS+MS PROGRAM

Since the amount of knowledge required for state-of-theart design is much greaterthan can be gained in a four-year BS program, a Master's degree is now considered the "career" degree in the Electrical and Computer Engineering field. An ECE graduate whoenters the field with a BS degree is expected to obtain a Master's degree as part of his/her long termcareer ad vancement. Graduates who enter the profession with Master's degrees start with cons iderably higher salaries and are eligible for more advanced positions.
The usual time required to directly obtain a BS in Electrical Engineering or a BS in Computer Engineering and an MS in Electrical and Computer Engineering is 4 years for the BS and an additional 5 quarters for the MS. This total of more than five and a half years is financially difficult and excessively delays entry into the industry. The Fast Track BS+MS programsignificantly shortens this path for top students by allowing up to 15 credits of ECE
graduate credits to be used for both the BSEE degree or the BSCMPE degree and the MSECEdegree.

## Admission criteria

Students will apply for this programusing an online application formthat is a slightly modified version of the standard graduate application form. Since many ECE students are making their way through their programs on a part-time bas is and are therefore ready to enter the program at different times, students may apply to enter the program during any quarter. A GRE score is not required. The admission criteria for the programare as follows:

- Admitted to the ECEDepartment for BSEE or BSCMPE
- 3.3 cumulative GPA
- 3.3 upperdivision major GPA with at least 16 credits of upperdivision ECEclasses


## Admission process and program flow

Applications for this program will be processed by the Graduate ProgramDirector just as regular graduate applications are. When a student is accepted, he/she will be assigned an ECE Faculty Advisor who is an expert in the MS coursework track choice stated in the application. Since the M.S. tracks closely parallel the coursework tracks in the BS programs, the MS track chosen will usually be justan extension of the track the applicant is pursuing in his/her undergraduate program. In most cases, the 400 level senior clas ses specified in an undergraduate track have both 400 and 500 levels available and the 500 level versions of these courses are included in either the Core list or the Depth and Breadth list for the related graduate level track. With Advis or approval, students in the Fast Track BS + MS program will take the 500 level versions of these classes and use up to 15 credits of these to satisfy both BS requirements and MS requirements. Note that 3 credits froma 4 credit class can be used to bring the shared total up to 15 credits but all shared classes must have grades of B or higher.

## Graduate programs

The ECE Department offers M.S., and Ph.D. degrees in a variety of Electrical and Computer Engineering technical areas. Programs are available on both a full-time and parttime bas is. Many classes are offered in the late afternoons and early evenings.

Please refer to the departmental website at www.pdx.edu/ece for detailed programinformation.

ADMISSION REQUIREMENTS

## Master of Science in Electrical and Computer Engine ering

Admissions to our M.S. programs are selective and capacity is limited. Learn how to apply. Master of Science in Electrical and Computer Engineering applicants with a B.S. degree in either electrical or computer engineering, and a grade point average of 3.00 or better in all juniorand senior-level technical courses will be directly considered for admis sion to the Department of Electrical and Computer Engineering as regular graduate students.
Applicants with a B.S. in either electrical or computer engineering with a grade point average in their upper division technical coursework below 3.00 but higher than 2.75 may be granted conditionaladmission status.

Applicants with a B.S. degree in some other field (e.g., mathematics, physics, computer science, mechanical engineering, economics, etc.) will be required to take an individually specified group of undergraduate ECE clas ses as a Post-Baccalaureate student to gain the basic skills needed to succeed in an ECE Master's program. Upon successful completion of these undergraduate ECE "bridge" classes with grades of B or better, an applicant will be considered for admis sion to the Department of Electrical and Computer Engineering as a regular M.S. student.
M.S. applicants with electrical or computer engineering B.S. degree froma non-ABET accrediteduniversity must submit official GRE scores. An applicant whoseB.S. degree is froma university in a country where English is not the native language must provide proof of English language proficiency as required by PSU International Admissions.

Applications are accepted for fall (starting in September) and winter (starting in January). Most graduate course sequences begin in the fall or winter quarters, and studen ts who arrive in spring or summer may have more difficulty finding suitable courses for their desired track.

## Application for Admission to M.S. Program

Please apply online.
More information (required documents, deadlines, etc.) is available on our Admis sions Process page.

## Doctor of Philosophy in Electrical and Computer Engineering

Applicants to the $\mathrm{Ph} . \mathrm{D}$. programin electrical and computer engineering will normally have completed a master's degree in electrical engineering or a related field. However, admis sion directly to the Ph.D. programfroma bachelor's degree programis possible if desired.
The following application items are required for the ECE Department:

- Statement of purpose
- GRE score
- 3 references
- Unofficial transcripts
- Writing sample

Please see our application page for more information.
Students are normally only admitted to our programif a faculty memberhas agreed to serve as the adviser. Before applying to our PhD program, you should contact faculty working in an area of research that is of interest toyou. Your adviser will stay the same throughout your time in the doctoral program. You can find a list of our faculty on our website. The department has many ong oing research programs and supporting research laboratories which are listed on our website.

## Application for Admission to Ph.D. Program

Please apply online.

More information (required documents, deadlines, etc.) is available on our Admis sions Process page.

## ELECTRICAL AND COMPUTER ENGINEERING M.S.

Thes is and coursework-only options are available in the ECE M.S. program. All ECE M.S. students are required to complete a ProgramCompletion Formapproved by their faculty advisers before completion of s ixteen EE and ECE graduate credits. In addition to the university master's degree requirements, an M.S. student must complete at least 45 graduate level credits. Coursework taken without adviser approval may not be accepted as part of the student's program. Each student will be assigned an interim adviser at the time of admis sion.

## THESIS OPTION

Thes is M.S. students usually follow a plan consisting of five $E E / E C E$ courses aligned with their thesis research area ( 20 credits), 9 credits of thesis, 2 credits of Grad School Es sentials (ECE 563 and ECE 564), and 14 elective credits. Elective credits may include additional EE and ECE graduate courses, EE 501-EE 509/ECE 501-ECE 509 credits, or, with adviser approval, graduate classes from another department. Only 3 credits of EE 507/ECE 507 may be counted as elective credits.
Students should choose a research topic and adviser for their thes is; information on research in the department can be found on the department's web site. Thesis M.S. students must also develop, write, and give an oral defense of a thes is approved by the student's thesis committee. The defense is public and its schedule must be posted in the Electrical and ComputerEngineering Department at least two weeks in advance. Please contact the Graduate Coordinator to schedule the defense and announcement.

See the department's web site for additional in formation about thesis requirements and deadlines.

## COURSEWORK-ONLY OPTION

For the coursework-only M.S. option, students take courses following an adviser-approved track of graduate clas ses. Please see the pre-approved coursework-only tracks below. These tracks were designed by the faculty to give both depth and breadth of knowledge in the specified study area. It is also possible forstudents to develop a custom track with their faculty adviser and approval by the Graduate ProgramDirector. The coursework-only option requires students to complete 16 credits of EE and ECE graduate lecture clas ses that forma core specialization area, 16 credits of EE and ECE graduate lecture classes that provide depth and breadth, 4 credits of electiveEE and ECE graduate lecture classes, and 9 credits of approved graduate electives.

The required 16 credits of core specialization foreach of the pre-approved coursework-only tracks are as follows:

## Analog, RF, and Microwave Circuit Design <br> ECE 521 Analog Integrated Circuit Design 4

ECE 522 Analog Integrated Circuit Design 4
ECE 531 Microwave Circuit Design I
ECE 532 Microwave Circuit Design II 4
Communications
ECE 561 Communication Systems Design I
ECE 562 Communication Systems Design II
EE 522 Discrete Time Proces sing
EE 523 Estimation and Detection 4
$\begin{array}{ccc}\text { Computer } & \text { Architecture and Design } & \\ \text { ECE } 585 & \text { Microprocessor SystemDesign } & 4\end{array}$
ECE 586 Computer Architecture 4
ECE 587 Advanced Computer 4
Architecture I
ECE 588 Advanced Computer Architecture II
Design Verification and Validation
ECE 571 Introduction to System Verilog for Design and Verification
ECE 585 Microprocessor SystemDesign
ECE 593 Fundamentals of Pre-Silicon Validation
ECE 595 Emulation and Functional Specification Verification
Digital IC Design
ECE 525 Digital Integrated Circuit Design I

ECE 526 Digital Integrated Circuit Design 4
ECE 530 PhysicalDesignof Digital 4 Integrated Circuits
ECE 581 ASIC: Modeling and Synthesis
4
Embedded Systems
ECE 540 System-on-Chip Design with FPGAs
ECE 544 Embedded SystemDesign with FPGAs
ECE 558 Embedded Systems
Programming
ECE 584 Foundations of Cyber-Physical Systems
Power Engineering
EE 530 Analytical Methods for Power
Systems
EE 531 PowerSystems Protection
Electrical Machine Analysis and 4
Design
ECE 545 PowerElectronic Systems 4
Design I
Signal Processing andMachine Learning
EE 516 Mathematical Foundations of 4
EE 520 RandomProcesses 4
EE 522 Discrete Time Processing 4
EE 523 Estimation and Detection 4
$\begin{array}{lll}\text { VLSI Physical Design Automation Track } & \\ \text { ECE } 516 & \text { Integrated Circuit (IC) } & 4\end{array}$

ECE 516 | Integrated Circuit (IC) |
| :--- | :--- |
| Technologies |

ECE 528 VLSI Computer-Aided Design 4
ECE 529 CAD for ULSI and Emerging 4
Technologies
ECE 583 Low Power Digital IC Design

## ELECTRICAL AND COMPUTER ENGINEERING PH.D.

In addition to the University doctoral degree requirements listed in the PSU Bulletin, a candidate for the Ph.D. degree in electrical and computer engineering must complete a minimum of 82 graduate credits consisting of at least 45 EE/ECE graduate credits, 2 credits of Grad School Essentials (ECE 563 and ECE 564), 8 elective graduate credits and at least 27 credits of ECE 603 (dissertation). Of the $45 \mathrm{EE} / \mathrm{ECE}$ credits, 32 credits must come from EE/ECE lecture courses (24 lecture credits if the student successfully completed an ECE MS Thesis). The 8 elective credits may come fromany academic department, but mustbe lecture credits only. Specific course requirements depend on the student's area of emphasis, and the student's programmust be approved by his/her academic adviser. Lecture courses taken under
the undifferentiated grading option $(\mathrm{P} / \mathrm{NP})$ shall not be used to satisfy any graduate degree program requirements. All coursework must be completed with a grade ofB- or better.
Students in the Ph.D. programin Electrical and Computer Engineering are required to pass a research proficiency examination by the end of theirsecond yearat PSU. Students shall demonstrate their ability to analyze, synthesize, andevaluate a body of knowledge within their domain of research. This satisfies the university requirement for a comprehensive exam.

Ph.D. students are also required to obtain appro val of their proposed research plan by their doctoral committee before they can be ad vanced to candidacy. A dissertation containing a real contribution to knowledge based on the candidate's own investigation and a final oral dissertation defense are required. The dis sertation musts how a mastery of the literature of the subject and be written in credible literary form. The defense is public and its schedule must be posted in the Electrical and ComputerEngineering Department at least two weeks in advance.
Each Ph.D. must have at least one journal publication. The student must be the principal author of a journal publication as approved by the committee. The publications must be approved as acceptable by the doctoral committee.
Students should choose a research topic and adviser for their dissertation. Further information on research in the department and the ECEPhD programcan be found on the department's PhD website.

## Engineering and Technology Management

LL Suite 50-02, Fourth Avenue Building 503-725-4660
www.pdx.edu/engineering-technology-management/

- M.S.-Engineering and Technology Management
- M.Eng.-Technology Management
- M.Eng.-Project Management
- M.Eng.-ManufacturingEngineering Management
- Ph.D.-Technology Management
- Graduate Certificates

Strong management skills are increas ingly important to technical professionals. Managing R\&D projects, technological systems, technicalorganizations and resources, and other professionals requires management knowledge and skills.

Engineers and scientis ts are faced with these challenges very early in their careers. Typically, within three to seven
years after graduation, they find themselves addressing complex is sues which necessitate that they play two roles simultaneously: the role of the specialist and the manager of technology. Those who choose the management path start moving toward management responsibilities while maintaining identity in their technical backgrounds - the Department of Eng ineering and Technology Management (ETM) has been designed for them.
The Department of Engineering and Technology Management addresses the needs of engineers and scientists whose objective is to advanceto technical management positions in business, industry, or government. Wealso address the needs of those wishing to continue theirengineering/technology management research-based studies while pursuing careers at either academic institutions or R\&D organizations.
ETM draws on the strengths of the Maseeh College of Engineering and Computer Science, the School of Bus iness Adminis tration, and several other relev ant academic disciplines. By utilizing the diverse faculty resources of Portland State University, the programoffers the opportunity to study the human, technical, and analytical as pects of management.
Most of the courses in the programare offered during the evening hours to fit the schedule of practicing professionals.

## ADMISSION REQUIREMENTS

## Master of Science in Engine ering and Technology Management

In addition to meeting general University admission requirements (p.52), applicants to the programare required to have a baccalaureate degree in engineering or related discipline, background in probability/statistics, and fouryears of professional experience. Admis sion is granted to applicants who are judged to have a higher potential as reflected by their past academic performance and professional experience. Any variation from these requirements must be approved by the ETM department.

## Graduate Certificate in New Product De velopment, Strategic Management of Technology, Technology Management, Project Management, and Technological Entre pre neurship

Admis sion requirements for the ETM certificates are identical to the ETM Department's MS program.

## ENGINEERING AND TECHNOLOGY MANAGEMENT, M.S.

A minimum of 52 credits in approved graduate courses is required to complete the Master of Science degree in Engineering and Technology Management. The program
consists of 28 credits in the core, 4 credits (or 8 with thes is option) in the capstone requirement, and 20 credits (or 16 with thes is option) in electives.

## REQUIREMENTS

## Core courses

| ETM 520 | Management of Engineering and <br> Technology | 4 |
| :--- | :--- | :--- |
| ETM 522 | Communication and Team <br> Building | 4 |
| ETM 530 | Decision Making | 4 |
| ETM 535 | Advanced Engineering | 4 |
|  | Economics | 4 |
| ETM 540 | Operations Research | 4 |
| ETM 545 | Project Management | 4 |
| ETM 555 | Technology Marketing | 4 |

## Caps tone requirement (one of the following; 4 credits or 8 credits with thesis option):

| ETM 506 | Capstone Project |
| :--- | :--- |
| ETM 590 | Engineering and Technology <br>  <br> Management Synthesis |
| ETM 503 | M.S.Thes is |4

## Electives ( 20 credits or 16 credits with the thesis option)

The Engineering and Technology Management Department offers a wide range of elective courses. In addition, students may choose electives in several other programs throughout the University with the approval of their adviser.

## ENGINEERING AND TECHNOLOGY MANAGEMENT M.ENG.

The Master of Engineering in Engineering and Technology Management programs are currently approved for the ETM department; however, we are not accepting applications at this time.

## TECHNOLOGY MANAGEMENT PH.D.

Admis sion requirements include Bachelors or higher degree in engineering, sciences, management with technology emphasis, or related disciplines; minimum 3.0 undergraduate GPA or 3.50 GPA in at least 12 graduate credits; GRE scores obtained within two years of application to the program; a detailed statement of research interests acceptable to the ETM faculty; minimum 575 TOEFL score for international applicants; and three letters of recommendation. In addition to the University's general degree requirements, the Ph.D. programin Technology Management consis ts of the following nine steps:
(Step-1): Admission to the program;
(Step-2): Successful completion of the equivalent of at least 60 credits of coursework beyond the Bachelor's degree distributed as follows: CORE: at least 20 credits
from the following courses with at least one course from each group. All courses are four credits each. Additional courses taken fromthis group beyond the minimum required 20 credit hours can be counted toward the fulfillment of the specialization course requirements describedbelow.

Group-1: ETM-620 Management of Engineering and Technology,ETM-649 Management of Technology Innovation;

Group-2: ETM-645 Project Management, ETM-655
Technology Marketing;
Group-3: ETM-626 Strategic Management of Technology, ETM-627 Competitive Strategies in Technology Management;

Group-4: ETM-631 Technology Assessment and Acquisition, ETM-633 Technology Transfer.
SPECIALIZATION: at least 20 credits fromcourses supporting the proposed res earch area, including Communications and Team-building, Strategic Planning, Manufacturing Systems Engineering, Manufacturing Systems Management, Total Quality Management, Technology Forecasting, Managing Intellectual Capital, Ethical Is sues in Technology Management, Technology Entrepreneurship, Project Management Framework, Project Management Tools, R\&D Management, New Product Development, Managing New Technology Introduction, Human Side of Technology Management, Mgmt-544: Technology Management, Mktg 548: Product Management and Innovation, MIM524: Global Sourcing and Supply, Psy 578: Leadership and Group Effectiveness, Psy 615: Advanced Industrial/Organizational Psychology, PA 545: Organization Development, PA 555: Program Evaluation and Management, PA 598: Value-based Management, Soc 557: Complex Organizations, Ec 531: Urban Economics, Ec 532: EnvironmentalEconomics.

METHODOLOGY: at least 20 credits fromthe following courses: Decision Making, Advanced Engineering Economics, Benchmarking Using Data Envelopment Analysis, Operations Research, Manufacturing Systems Simulation, Research Methods for Engineering and Technology Management, Technology Forecasting, Decision Support Systems: Data W arehousing, Project Management Tools, Strategic Intelligence, Psy 621: Univariate Quantitative Methods, Ps y 622: Multiple Regression \& Multivariate Quant Methods, Psy 623: Factor Analysis \& Covariance Structure Modeling, Ps y 593: Decis ion Making Laboratory, Mth 667, Mth 668, Mth 669: Stochastic Processes and Probability Theory-I, II, III,
Mth 692: Research Methodology and Design, Stat 451,
Stat 452: Applied Statistics for Engineers and Scientists-I,
II, Stat 564: Applied Regression Analysis, SySc 514:
SystemDynamics, SySc 625: Agent Based Simulation,
SySc 627: Discrete SystemSimulation, SySc 629:
Business Process Modeling and Simulation, USP-655:

StructuralEquation Modeling, USP 656: Multilevel Regression, Soc 597: Applied Survey Research, Ec 586: Project Evaluation, Ec 570: Econometrics. The student may also choose additional courses in other academic units throughout the university, approved by their adviser, if such courses are supportive of their proposed research areas.
(Step-3): 12 project credits of ETM 606 supervised by ETM faculty culminating in the preparation of a research paper evaluated by the ETM faculty as being at the level of acceptable papers for a national or international conference on Engineering and Technology Management.
(Step-4): Successful completion of a comprehensive examination to demonstrate mastery of the Engineering and Technology Management field, including the defense of the research paper described in step 3 above.
(Step-5): Selection of the dis sertation adviser fromthe ETM faculty and formation of the Ph.D. committee including one member appointed by the Dean of Graduate Studies.
(Step-6): Development of the dissertation proposal and its approval by the Ph.D. committee resulting in the advancement to Ph.D. candidacy.
(Step-7): Registering for at least 27 dis sertation credits while conducting research after successful completion of the comprehensiveexam.
(Step-8): Preparation of at least one publis hable paper for a research journal or a recognized refereed technical conference proceedings basedupon the dissertation research.
(Step-9): Defense of the dissertation.

## Graduate Certificates

## NEW PRODUCT MANAGEMENT

The certificate prepares engineers and computer scientists for managerial roles in product management, new product development, and technology marketing with a focus ontechnology products (hardware, software, services).

| You must take four of the following courses: |  |  |
| :--- | :--- | :--- |
| ETM 543 | New Product Planning and Trend | 4 |
|  | Foresight |  |
| ETM 547 | New Product Development | 4 |
| ETM 549 | Management of Technology | 4 |
|  | Innovation |  |
| ETM 555 | Technology Marketing | 4 |
| ETM 556 | User-Centered Innovation | 4 |
| ETM 558 | Engineering Financial <br>  Management | 4 |

Total Credit Hours: 16
PROJECT MANAGEMENT

| You must take four of the following courses: |  |  |
| :--- | :--- | :--- |
| ETM 522 | Communication and Team | 4 |
|  | Building <br> ETM 525 | Strategic Planning |
| ETM 544 | Organizational Project | 4 |
|  | Management | 4 |
| ETM 545 | Project Management | 4 |
| ETM 546 | Project Management Tools | 4 |
| ETM 560 | TotalQuality Management | 4 |

Total Credit Hours: 16

## STRATEGIC MANAGEMENT OF TECHNOLOGY

| You must take four of the following courses: |  |  |
| :--- | :--- | :--- |
| ETM 526 | Strategic Management of <br> Technology | 4 |
| ETM 527 | Competitive Strategies in <br> Technology Management | 4 |
| ETM 530 | Decision Making |  |

Total CreditHours: 16

## TECHNOLOGICAL ENTREPRENEURSHIP

| You must take four of the following courses: |  |  |
| :---: | :---: | :---: |
| ETM 531 | Technology Assessment \& Acquisition | 4 |
| ETM 535 | Advanced Engineering | 4 |
|  | Economics |  |
| ETM 548 | Managing New Technology | 4 |
|  | Introduction |  |
| ETM 561 | Technology Entrepreneurship | 4 |
| ETM 562 | New Venture Management | 4 |
| ETM 573 | Management of Intellectual | 4 |
| Total Credit Hours: 16 |  |  |
| TECHNO | GY MANAGEMENT |  |


| You must take four of the following courses: |  |  |
| :--- | :--- | :--- |
| ETM 519 | Human Side of Technology <br> Management | 4 |
| ETM 520 | Management of Engineering and | 4 |
| ETM 532 | Technology <br> Technology Forecasting | 4 |
| ETM 533 | Technology Transfer | 4 |
| ETM 567 | Knowledge Management | 4 |
| ETM 568 | Energy Technology Innovations | 4 |

## Total Credit Hours: 16

## Mechanical \& Materials Engineering

Suite 400, Engineering Building
503-725-4290

## mmedept @pdx.edu

www.pdx.edu/mechanical-materials-engineering/

- Bachelor of Science in Mechanical Engineering (BSME)
- Master of Sciencein Mechanical Engineering (MSME)
- Master of Sciencein Materials Science and Engineering (MSMSE)
- Doctorate in Mechanical Engineering (PhD)
- Graduate Certificate:Semiconductor Materials and Manufacturing (SMMGC)

Mechanical \& Materials Engineering is a multi-faceted programoffering a strong educational experience steeped in a variety of research areas, which includes mechanical design, additive manufacturing, robotics, microgravity fluid management, microfluidics, nanomaterials, semiconductor materials, biomaterials, and metallurgy. Located in Portland, Oregon, the Department benefits from strong ties to local industries, as well as international partnerships.

## Undergraduate program

The Bachelors of Science in Mechanical Engineering (BSME) programis a $2+2$ program. Students spend their first two years taking lower-division courses in math, science, and engineering. At the end of their sophomore year, students apply for admis sion into the BSMEupperdivision program.
Students admitted to the BSMEupper-division program will be placed on one of two course plans for their junior year. These two course plans are the ME313 First Course Plan and the ME320 First Course Plan. These course plans are designed to maintain a healthy class size and help make sure that seats are available for newly admitted students. All juniors will complete the same courses, just in a different order, and still meet prerequisites.

## MECOP students are placed on the course plan that aligns with MECOP program requirements.

By following the as signed course plan, a student is able to complete the BSME in four years. As a reminder, the Department requires students to complete all highlighted classes with a grade of 'C' or better, prior to applying for admission into the upper-division program.

Our BSME programis accredited by the Engineering AccreditationCommission of ABET, 415 North Charles Street, Baltimore, MD 21201; telephone 410-347-7700. ABET is the national organization that sets standards for engineering education defined in terms of curricular content, quality of faculty, and adequacy of facilities.

## DEGREE MAPS AND LEARNING OUTCOMES

To view the degree maps and expected learning outcomes for Mechanical \& Materials Engineering's undergraduate degrees, go to www.pdx.edu/academic-programs/a-z.

## PROGRAM OBJECTIVES

The BSME curriculumhas the following Program Educational Objectives:

## -

Graduates are employed as mechanicalengineers or in related fields that benefit froma mechanicalengineering education.
-
Graduates advance in their profession and engage in the professional community.
-
Graduates participate in post-graduate educational opportunities.

The BSME ProgramEducational Objectives were formulated in a proces s of consultation with students, faculty, PSU adminis trators, and the MMEIndustrial Advisory Board. The ProgramEducational Objectives were updated in April 2011 to allow attainment of the objectives to be measured quantitatively. These objectives describe the goals we expect our students to attain within three years of graduating with a BSMEdegree.

## MME ADMISSION REQUIREMENTS

For students applying for 300-levelMMEcourse admis sion FALL2023

## Terms of Admission \& Deadlines

- 

Fall admissiononly
-
Application deadline is April 15
-
Late Application deadline is June 15
-
MMEapplication is on department website: www.pdx.edu/mechanical-materials-engineering/bsmeadmission
-
If not a current PSU student, please apply first to PSU: www.pdx.edu/admis sions/undergraduate-admis sions

## Minimum Eigibility for Consideration

- 

All required/shaded classes on the BSMEcourse plan completed prior to fall 2023 with a grade of C or better. A C- will not count as meeting admis sion criteria.
-
A Selective Admis sion GPA of 2.25 or higher. The Selective Admission GPA is calculated using only the required/shaded courses on the BMSEcourse plan, excluding Freshman Inquiry or, for transfers, Wr 121 and Comm 220.
-
Freshman Inquiry (for those whobeganPSU as freshman) or Wr 121 and Comm 220 (for transfer students) must be completed prior to fall

## Selective Admission

- 

All students who meet the minimum grade requirement and have no more than 6 required/shaded
-
Selective Admission GPA courses outstanding as of April 15,202 will be considered. The outstanding courses must be completed prior to the start of fall term. Examples:
$\mathrm{OK}=$

Spring 2022 - EAS 212, EAS 215, ME 122, Mth 261

Summer 2022 - Mth 256, Ph 213/216, Comm 220

7 classes total, 6 are required for GPA
Not OK =

Spring 2022 - EAS 212, EAS 215, ME 122, Mth 261

Summer 2022 - Mth 256, Ph 213/216, ECE 241

7 classes total, 7 are required for GPA
-
Selective Admis sion GPA will not be calculated for any student until winter grades are received by the MME Department. Students with a Selective GPA of 2.25 or above will be conditionally admitted into the program. Conditions will be the completion of outstanding required courses, outlined in the admis sion letter. A 'pending spring grades' decision will be relayed to students with a Selective GPA below 2.25. Transfer students who do not provide unofficial transcripts with winter grades may be denied admission. Transcripts can be sent to mmedept@pdx.edu.
-
Admission will be offered to the top students (approximately 120), including conditionally admitted students, based on their Selective Admission GPA.

If a conditionally admitted student does due diligence and cannot locate the necessary
course(s) at PSU or localcommunity colleges, it is possible thecondition may be extended through end of fall. Extension must be approved by the MME Academic Advisor. Official transcripts must be provided to both PSU Admis sions Office and MMEDepartment once grades post to determine if the conditions were met.
-
Admission decisions will generally be communicated to students via email by May 15, 2023. Decisions will be:

Admit

Conditionally Admit
-
Pending spring Grades (officialdecision will be sent after spring grades are evaluated)
-
Deny (students may request a meeting with the MME Academic Advis or to review decision)

## Repeated Classes

Standard PSU repeat/replace policy applies to Selective Admission GPA:
-
If a studentearned a $\mathrm{D}+$ or below in a class the first time, then only the repeated (second) grade will be used in the Selective GPA calculation
-
If a studentearned a C - or above in a class the first time, then both the first grade and the second (repeated) grade will be used in the Selective GPA calculation

Should a class be taken a third time it does not replace the second attemptreg ardless of either grade

## Additional Testing

- 

No test required

## Pass/NoPass

- 

Required clas ses mustbe taken for a grade (not P/NP)
Note: Due to COVID-19, P grades will be accepted for courses completed during spring 2020 through spring 2021 only.Please reach out to mmedept@ pdx.edu for additional information.
-
If a studentearns a NP in a required class it will be calculated in selective admis sion GPA as an F and the course must be taken for a grade

Note:There is no COVID-19 exception to the NP policy

Additional Information (exceptions, preferences, etc.)

No preference given to PSU students versus students who completed required/shaded courses elsewhere

## Department Communication

The MMEDepartment (mmedept@ pdx.edu) will communicate to students via email. If the student has a pdx.edu email, all email communications will be sent to that address.
-
Fall 2024 admis sion requirements available spring 2023 (in time for fall 2024 regis tration in May 2023)

## ELIGIBILITY

Students must complete the following required/shaded courses with a minimum grade of $\mathbf{C}$ :

Ch 221 General Chemistry I 4
Ch 222 General Chemistry II 4
Ch 227 General Chemistry Laboratory 1
Ch 228 General Chemistry Laboratory 1
EAS 211 Statics 4
EAS 212 Strength of Materials 4
EAS 215 Dynamics 4
ECE 241 Introductionto Electrical 4 Engineering
ECE 241L Introductionto Electrical 0 Engineering Lab
ME 120 An Introduction to Engineering 3
ME 121 Introductionto Systems and 3
ME 122 Introductionto Design 3
Mth $251 \quad$ Calculus I 4
Mth 252 Calculus II 4
Mth 254 Calculus IV 4
Mth 256 Applied Ordinary Differential 4 Equations
Mth 261 Introduction to Linear Algebra 4
Ph $211 \quad$ General Physics (with Calculus) 4
Ph $212 \quad$ General Physics (with Calculus) 4
Ph $213 \quad$ General Physics (with Calculus) 4
Ph $214 \quad$ Lab for Ph 201 or Ph 211 or $\mathrm{Ph} \quad 1$
Ph $215 \quad$ Lab forPh 202 or Ph 212 or Ph $\quad 1$
Ph $216 \quad$ Lab forPh 203 or Ph 213 or $\mathrm{Ph} \quad 1$ 223 or Ph 233
Freshman Inquiry 15
$\mathrm{Ph} 221, \mathrm{Ph} 222$, and Ph 223 also accepted, if completed prior to Fall 2018.

Freshman Inquiry: Comm 220 and Wr 121 for transfer students.

## CONTINUATION CRITERIA

After admis sion to the BSMEProgramstudents will be expected to make satis factory progress toward their declared degree and will be subject to the following rules:

1. The term GPA in all courses taken at PSU must be 2.00 or higher.
2. At the conclusion of each termof the academic year, full-time students are normally expected to complete a minimum of 12 credits applicable toward their degree program. Part-time students are expected to complete a minimum of 12 credits per year applicable toward their degree program.
3. Students will be placed on probation when their term GPA as described in (1) is below 2.00 , or their progress toward the degree is less than that described in (2).
4. Students placed on probation for two consecutive terms or for a total of three terms will be suspended from the BSME program. Students also will be suspended if not enrolled in engineering and/or computer science courses for threeconsecutive terms.
5. Students who are suspended must meet with an advisor to determine whether and under which conditions readmission is feasible.
6. Students must have a major GPA of at least 2.0 in order to graduate with their BSME.

## APPEALS

Students denied admis sion or suspended may request reconsideration by submitting a petition. The petition and supporting materials will be reviewed by the Undergraduate Advisor of the Mechanical \& Materials Engineering Department; a recommendation will be forwarded to the Chair. The Advisor's decision can be appealed by the Chair. Appeals must be made within 30 days of denial of admis sion or suspension notification.
PASS/NO PASS GRADING POLICY
All courses specifically required by the University or by the Department must be taken for a letter grade unless a required course is only offered with a pass/no pass option.

## BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING DEGREE REQUIREMENTS

Majors in Mechanical Engineering must complete the following University and Departmental degree requirements. Any deviation from the required courses, including engineering and mathematics course substitutions, must be approved, in writing, by the Chair of the Department of Mechanical \& Materials Engineering.

## REQUIREMENTS

| Freshman year |  |  |
| :--- | :--- | ---: |
| Ch 221 | General Chemistry I | 4 |
| Ch 222 | General Chemistry II | 4 |
| Ch 227 | General Chemistry Laboratory | 1 |
| Ch 228 | General Chemistry Laboratory | 1 |
| ME 120 | An Introductionto Engineering | 3 |
| ME 121 | Introductionto Systems and | 3 |
|  | Control |  |
| ME 122 | Introductionto Design | 3 |
| Mth 251 | Calculus I | 4 |
| Mth 252 | Calculus II | 4 |
| Mth 261 | Introductionto Linear Algebra | 4 |
|  | Approved Science elective | 4 |
|  | Freshman Inquiry | 15 |

Approved Science Elective: Any course from
Biology, Environmental Science \& Management,
Chemistry, Geology or Physics not explicitly listed as a
degree requirementor Upper Division Cluster course (CH
104-106, PH201-203, PH221-223 are also excluded.)

Sophomore year
EAS 211 Statics 4

EAS 212 Strength of Materials 4
EAS 215 Dynamics 4
ECE 241 Introductionto Electrical 4 Engineering
ECE 241L Introductionto Electrical 0
Engineering Lab
Mth 254 Calculus IV 4
Mth 256 Applied Ordinary Differential 4
Equations
Ph 211 General Physics (with Calculus) 4
I
Ph 212 General Physics (with Calculus) 4
Ph 213 General Physics (with Calculus) 4
Ph $214 \quad$ Lab forPh 201 or Ph 211 or $\mathrm{Ph} \quad 1$
221 or Ph 231
Ph $215 \quad$ Lab for Ph 202 or Ph 212 or $\mathrm{Ph} \quad 1$
222 or Ph 232
Ph $216 \quad$ Lab for Ph 203 or Ph 213 or $\mathrm{Ph} \quad 1$
223 or Ph 233
Sophomore Inquiry 8
Subtotal: 47

| Junior year |  |  |
| :---: | :---: | :---: |
| BA 306U | Essentials of Finance for Non- <br> Business Majors | 4 |
|  | or |  |
| Ec 314U | Private and Public Investment | 4 |
|  | Analysis |  |
| ME213 | Properties of Materials | 4 |
| ME213L | Properties of Materials Lab | 0 |
| ME240 | Survey of Manufacturing | 2 |
|  | Processes |  |
| ME240L | Survey of Manufacturing | 0 |
|  | Processes Lab |  |
| ME 250 | Geometric Modeling | 2 |
| ME313 | Analysis of Mechanical | 4 |
|  | Components |  |
| ME314 | Analysis and Design of Machine | 4 |
|  | Elements |  |
| ME320 | Fluid Mechanics | 4 |
| ME320L | Fluid Mechanics Lab | 0 |
| ME 321 | Engineering Thermodynamics I | 4 |
| ME 322 | Applied Fluid Mechanics and | 4 |
|  | Thermodynamics |  |
| ME323 | Heat Transfer | 4 |
| ME350 | Programming and Numerical | 2 |
|  | Methods |  |
| $\begin{aligned} & \text { ME } 351 \\ & \text { Wr327 } \end{aligned}$ | Vibrations and SystemDynamics | 4 |
|  | Technical Report Writing | 4 |
|  | Subt |  |
| Senior year |  |  |
| ME370 | MechanicalEngineering | 2 |
|  | Profession |  |
| ME411 | Engineering Measurement and | 4 |
|  | Instrumentation Systems |  |
| ME411L | Engineering Measurement and | 0 |
|  | Instrumentation Systems Lab |  |
| ME488 | Design of Experiments | 4 |
| ME491 | Design Process | 2 |
| ME 492 | Conceptual Design Project | 4 |
| ME493 | Detailed Design Project | 4 |
|  | Approved mechanical engineering electives | 16 |
|  | Upper-division cluster | 8 |

## Approved Mechanical Engineering electives

Electives include any non-required 400/500*-level mechanical engineering course, except that no more than 4 credits be taken from:
ME401 Research 1-6

ME404 Cooperative Education/Internship 1-12
ME405 Reading and Conference 1-6
ME406 SpecialProjects 1-6

Further, students can take one MCECS non-ME400/500*level course and apply it toward elective credits. Students can take an additional MCECS non-MEcourse, if taken at the 500*-level, with advisor approval.
MECOP students must complete EAS 407, MECOP Seminar.
*Non-Pathway students completing any 500-level course(s) will need to complete a Request to Use Graduate Courses for UndergraduateDegree Formand waive their ability to apply the course(s) to a graduate program.

## HONORS TRACK

## Entry Requirements

- 

Admis sion to the BSMEProgram
-
MinimumPSU GPA of 3.50
-
Minimum 16 credits of 300 -level ME coursework completed
-
Application to the Mechanical Engineering Honors Track -

Statement of purpose outlining research interest areas

## Application Deadline

- 

Students must apply by the end of the third term of their junior year. Applications need to be submitted by the end of finals week.

## Graduation Requirements

- 

Completion of 4 ME 403 Honors Thesis credits with a minimum grade of $\mathrm{B}+$ (will be considered an approved mechanicalengineering elective)
-
Presentation of research to MMEfaculty and students in a seminarformat

Minimum PSU GPA of 3.50

Each student participating in the Honors Track will be assigned an honors advis or. The advisor will work with the student to complete a written proposal for the Honors Thes is research, conducted in a specialty area within Mechanical Engineering. Students who successfully complete the MMEHonors Graduation Requirements will graduate with Honors and will receive special recognition on their diploma.

## BACHELOR'S + MASTER'S PATHWAY

## Bachelor's + Master's Pathway Overview

The Bachelor's + Master's Pathway Programallows currently admitted BSMEstudents to get a head-start on their master's degree. Students admitted into the Pathway Programare able to take up to 16 credit hours of approved 500 -level course work as an undergraduate, at an undergraduate tuition rate*, and apply the credits to their undergraduate and graduate degrees. Admitted Pathway students have the potential to start their graduate program with 16 credits already completed.

Students must apply by the third termof their junior year, and if admitted, will automatically matriculate into an MMEgraduate programas long as they meet the pathway continuation criteria. Students in the Pathway Programcan pursueany of the MMEmaster-level graduate programs.
*Post-bac students will be charged graduate tuition rates perPSU policy.

## Credit Application

Once Pathway students are formally admitted into an MMEgraduate program, the Department will request the 500 -level credits taken as an undergraduate to be applied to their master's degree. Only coursework with a grade of B or higher will be applied. Students must start their master's program within one academic year of BSMEgraduation in order to use their pathway courses towards their master's degree.

## Admission Criteria

Students applying to the Pathway Programmust meet the following criteria:
-
Admitted into the BSMEProgram
-
Completed 10 credit hours of 300 - or 400 -level upperdivision BSMEcoursework
-
Institutional GPA of 3.3 at time of application
-
Three letters of recommendation fromfaculty members (MMEfaculty members preferred)
-
Statement of purpose

## Continuation Criteria

Students must have a combined undergraduate and graduate institutional GPA of 3.3 upon graduation fromthe BSME programto be fully admitted into the graduate program.

## Application Deadline

Students must apply by the end of the third term of their junior year. Applications need to be submitted by the end of finals week.

## Graduate programs

The MMEDepartment offers three graduate degrees and one graduatecertificate: Master of Science in Mechanical Engineering (MSME), Master of Science in Materials Science (MSMSE), PhD in Mechanical Engineering, and the Semiconductor Materials and Manufacturing Graduate Certificate (SMMGC). Each programis designed to help students achievecareer goals, meeting industry, or research interests.

Master's students who plan to work or who are currently working in indus try have the ability to earn a master's degree by completing coursework and foregoing research, while students seeking research opportunities or advancement to a PhD programhave the option to perform research with a variety of faculty members, and complete either a thes is or project. PhD students are required to conduct research and complete a dis sertation.

Focus areas, research possibilities, faculty and lab information can be found here: Graduate Focus Areas.

## ADMISSION REQUIREMENTS

## Master of Science in Mechanical Engineering (MSME)

Applicants who have received a Bachelor of Science degree, and who meet University graduate admis sion requirements, will be considered for admis sion as outlined below:

Regular admis sion:

- Applicants who have a Bachelor of Science in Mechanical Engineering or in a closely related engineering field
- Applicants who have a Bachelor of Science in a related field such as materials science, physics, chemistry, or biology who have also completed the following undergraduate courses (or equivalents) based on focus area:
- Design \& Manufacturing: ME313 Analysis of Mechanical Components, ME314 Analysis and Design of Machine Elements, and ME351 Vibrations and SystemDynamics
- Thermal \& Fluid Science: ME320/L Fluid Mechanics, ME321 Engineering Thermodynamics I, and ME323 Heat Transfer

Conditional admission:

- Applicants who have received a Bachelor of Science degree in a related field such as materials science, physics, or chemistry, but have not completed the recommended pre-admis sion courses listed above.
Applicants will need to provide three letters of recommendation, a statement of purpose, and a res ume or curriculumvitae.

Note: The MMEDepartment does not provide conditional admission for English language proficiency deficiencies.

## Master of Science in Materials Science and Engineering (MSMSE)

Applicants who have received a Bachelor of Science degree, and who meet University graduate admis sion requirements, will be considered for admis sion as outlined below:

## Regular admission

- Applicants who have a Bachelor of Science in Material Science \& Engineering or in a closely related engineering field
- Applicants who have a Bachelor of Science in a related field such as mechanical engineering, physics, chemistry, orbiology who have als o completed the following undergraduate course (or equivalent):
- ME 213/L Properties of Materials

Conditional admission:

- Applicants who have received a Bachelor of Science degree in a related field such as mechanical engineering, physics, chemistry, or biology, but have not completed the recommended pre-admission courses listed above.

Applicants will need to provide three letters of recommendation, a statement of purpose, and a resume or curriculumvitae.

Note: The MMEDepartment does not provide conditional admission for English language proficiency deficiencies.

## Doctorate in Mechanical Engine ering (PhD)

A Master of Science degree in Mechanical Engineering, or a closely related field, is required forstudents applying to the mechanical engineering PhD program. Applicants will need to provide three letters of recommendation, a statement of purpose, a resume or curriculum vitae, and current GRE scores. GRE scores are not required if the master's degree was completed at PSU. Additional admission requirements and details are published on the MMEdepartment web site at
https://www.pdx.edu/mechanical-materials-engineering/.
We require that qualified PhD applicants be as signed a faculty advisor who is in the applicant's related area of research interest in order to be admis sible.

Note: The MMEDepartment does not provide conditional admission for English language proficiency deficiencies.

## MASTER OF SCIENCE IN MECHANICAL ENGINEERING

The Master of Science in Mechanical Engineering provides advanced coursework and research within the various facets of mechanical engineering. Strongly tied to local industry and international partnerships, the program supports research in microfluidics, fluid flow in microgravity, manufacturing, electronic packaging, engineering science and energy conservation in the built environment. Current faculty research areas include energy systems, electronic cooling, dynamic systems modeling,
computational mechanics, thermo-fluid systems, andFEM applications in mechanical design.

Candidates must meet the requirements of the University and the Department for the MSMEdegree. The program offers three tracks: thesis, project and coursework-only. For all tracks, candidates must complete 45 graduate credits, which include ME551 and up to 2 credit hours of ME 507.

Candidates pursuing the thesis option must complete 9 thesis credits (ME503). Those pursuing the project option must complete 6-9 research credits (ME501). All candidates can apply up to 17 credit hours in total of ME 501, ME 503, ME 504 (maximum 6 credits), ME505, and ME 506 to their degree. Candidates may apply a maximum of 8 credit hours of approved non-mechanical engineering credits toward their electives.

All candidates must submit a study plan approved by their advis or by the beginning of their third term. Updates to the study plan may be requested by the advisor or the graduate committee. Studentresearch (thesis or project) is conducted under the supervision of faculty and a final oral examination covering the thesis or project must be successfully completed.

## MATERIALS SCIENCE AND ENGINEERING M.S

The Master of Science in Materials Science and Engineering degree provides advanced coursework and research that blends basic materials science with fundamental engineering principles and practice. Closely tied to industry needs and applications, the program supports research in nanomaterials, semiconductor materials, biomaterials, composites, metallurgy, welding, micro-joining, manufacturing, computational modeling, materials synthesis, post-treatment, and characterizations. The flexibility of the programstructure encourages students to explore research not only in conventional disciplines, but also in inter- or multi-disciplines. There are many research thrusts in this programthat span a wide range of cutting-edge and cross-disciplinary areas.

Candidates must meet the requirements of the University and the Department for the MSMSEdegree. The program offers three tracks: thesis, project, and coursework only. For all tracks, the candidate must finish 45 graduate credits. Among these credits, a minimum of three core courses selected fromME513 (or MSE 513) ME 527, ME 528, ME 529, ME 576, ME 578, MSE 515, and MSE 547 are required. One credit of seminar course of ME507 is also required. If the candidate chooses the thesis option, a total of 6-9 MSE 503 credits will be received after successful completion of the defended thesis. If the
candidate chooses the project option, a totalof 6-9MSE 501 credits will be received after successful completion of the project report and a departmental-level presentation. For the rest of the credits, the candidate can obtain them from a set of specialty courses approved by the student programcommittee. If the candidate chooses the courseonly option, a minimum of five core courses selected from the list mentioned above is required. The rest of the graduate credits can be chosen fromelectives recommended by the student programcommittee. For all tracks, a maximum of two credits of ME507 or approved seminar can be applied to the degree.

Each student is as signed to an advisor upon acceptance to the program, and the advisor will be the primary contact for the student in the Department. The student program committee, a group of three faculty members, will meet with each student twice per year to review the course of study that the student and advisor have chosen and to monitor overall programquality.

## DOCTORATE IN MECHANICAL ENGINEERING

The PhD programin Mechanical Engineering aims to educate technicalexperts and researchers to fill leadership roles in industry, research and education. The program culminates in a written dis sertation representing an original contribution to knowledge in the field. Research areas for the degree include, but are not limited to, bioengineering, building science and energy systems, controls and dynamics, fluid mechanics, heat transfer, materials science, and mechanical design. Candidates for the PhD must meet the Univers ity requirements for the degree in addition to the requirements listed below.
In addition to the University doctoral degree requirements (p. 55), the programrequirements include a minimum of 27 credit hours of Mechanical Engineering coursework, a comprehensive examination, prospectus defense, 27 credit hours of dis sertation (ME603) and finaldis sertation defense. The 27 credit hours of Mechanical Engineering coursework must consist of a minimum of 8 credits of 600level courses, which can include up to 3 credits of ME607 seminar. For further information on admis sion and degree requirements, current course schedule, and research opportunities, students should refer to the Department web site:https://www.pdx.edu/mechanical-materialsengineering/.

## SEMICONDUCTOR MATERIALS \& MANUFACTURING

The Semiconductor Materials \& Manufacturing Graduate Certificate is a 16 -credit program. Graduate-level courses in semiconductor materials, manufacturing processes,
materials characterization and failure analysis techniques are bundled in this program.

Students are required to take ME577 and a minimum of 3 additional courses from the list below to earn the certificate.

## Required course:

| ME577 | Introductionto Semiconductor | 4 |
| :--- | :--- | :--- |
|  | Manufacturing |  |


| Choose three of the following: |  |  |
| :---: | :---: | :---: |
| ME 513 | Engineering Material Science | 4 |
| ME 527 | Phase Transformations and | 4 |
|  | Kinetics in Materials |  |
| ME528 | Scanning Electron Microscopy for Materials and Device | 4 |
|  | Characterization |  |
| ME 529 | Transmission Electron | 4 |
|  | Microscopy and Chemical |  |
|  | Analysis of Materials |  |
| ME 547 | Transfer and Rate Processes | 4 |
| ME576 | Materials Failure Analysis | 4 |
| ME578 | Introduction to Electronic | 4 |
|  | Packaging |  |

# GRADUATE SCHOOL PROGRAMS 

## Rossitza B. Wooster

Dean of the Graduate School
184 Parkmill (1633 SW Park Avenue)
503-725-8410
pdx.edu/gradschool

Portland State University graduate programs offer a variety of opportunities for ad vanced study and research, including preparation for academic or profes sional careers, continuation and improvement of skills for in-service profes sionals, personal intellectual enrichment, and profes sional development. More than 5,000 graduate students are enrolled in the University's colleges and schools, and over 1,900 graduate degrees are awarded annually in the more than 80 master's and the 21 doctoral programs.

The Graduate Schooloversees the University's graduate programs in the interest of ensuring quality instruction and research and promoting the highest achievement of graduate students. It is the principal res ource concerning graduate admission policies and procedures, advanced degree requirements, degree status, petition procedures, thesis or dissertation preparation, and final oral examinations.

All matters of graduate study are subject to the policies and procedures established by the Faculty Senate upon recommendation of the Graduate Council. The Graduate Council develops and recommends University policies and regulations for graduate studies, recommends standards for graduate courses and programs, and adjudicates petitions regarding graduate policies. The Dean of the Graduate School is res ponsible for conducting the affairs of the Graduate School and for certifying candidates who have fulfilled the requirements for advanced degrees.

## GRADUATE CERTIFICATE IN FUTURES THINKING AND FORESIGHT PRACTICE

This certificate offers students and experienced profes sionals the opportunity to deepen their understanding of futures thinking and foresight practice to positively impact a highly volatile and complexlandscape recently referred to as "post-normal times." Given rapid and exponential acceleration that is occurring across both public and private sectors, a new mindset and new skills are needed to navig ate this complexity and build success pathways to desired futures. Increasing "readiness for the future" has become an urgentcall to action across disciplines and professional spheres of influence. This 18credit learning experience includes focus on technological change, climate change, geo-political shifts, racial equity
and such topics as the future of work, food, learning and more.
Foresight is an emerging interdisciplinary social science comprised of ps ychology, sociology, anthropology and social work, the arts, political science, business, technological studies, urban studies, public administration, engineering and technology sciences, economics, and other geo-politicalfocal areas (to name a few). Futures thinking and foresight practicereflect a collection of applied skills and tools related to a specific type of anticipatory thinking, applied ethics in a futures context and related change management/navigation skills. It is also about increasing proficiency in building collective intelligence, imagination, agency and agility in individuals, groups, organizations and civic collectives with regard to self-determination and democratically anchored futures planning. Interdisciplinary elective coursework will allow students to personalize fromamong a list of future forward courses that best meet their professional goals and their intended future focus.

The certificate includes a deep exploration of settings and methods where foresight is currently being practiced in both the public and private sectors, a review of fores ight research and methods and profiles of futurists who lead these processes. With a special focus on leading efforts to build foresightfulness within communities and/or organizations through trend mapping, power analysis, goal setting in a "VUCA" practice en vironment (volatility, uncertainty, complexity and ambiguity), students learn the fundamentals of engaging individuals, groups and org anizations in a positive experience of navigating futures conceptualization and planning. Is sues of equity and strategies to democratize co-creation of shared futures, acknowledge/address bias and patterns of his torical bias are prioritized. A concluding integration course provides a culminating experience to engage in shared learning and cross-disciplinary review of foresight projects, as well as creation of a professional foresight portfolio useful to those seeking to enhance their career readiness in this area.

## Core ( 10 credits)

| ISt 520 | Introductionto Foresight and <br> Futures Practice | 4 |
| :---: | :--- | :---: |
| ISt 521 | Applying Foresight Frameworks <br> and Building Futures Practice | 4 |
| ISt 522 | Integrative Futures Practice | 2 |
| Eectives (8 credits) |  |  |
| Approved list of elective courses: |  |  |
| Ec 543/ESM | Global Environmental <br> 543 | Economics |


| Mgmt 518 | Digital Transformation of Business | 4 |
| :---: | :---: | :---: |
| Mgmt | Design Thinking for Social | 4 |
| $\begin{aligned} & 521 / \mathrm{Mgmt} \\ & 521 \mathrm{~S} \end{aligned}$ | Innovation |  |
| Mgmt 522S | Money Matters for Social Innovation | 4 |
| Mgmt 523S | Storytelling and Impact <br> Measurementfor Social Innovation | 4 |
| PA 513 | Adminis trative Ethics and Values | 3 |
| PA 514 | Global Leadership and Management | 3 |
| PA 516 | Current Issues in Public Management | 3 |
| PA 536 | Strategic Planning | 3 |
| PA 543 | Creating Collaborative Communities | 3 |
| PA 598 | Values-based Management I | 3 |
| SW 510 | Futures Thinking and Foresight Practice for Equity, Well-Being and Community Flourishing | 3 |
| $\begin{aligned} & \text { USP } \\ & 560 / \mathrm{EMCR} \\ & 560 \end{aligned}$ | Climate Resiliency Planning | 3 |

Other courses may be used as electives with approval of the ProgramDirector.
Total CreditHours: 18

# UNIVERSITY HONORS COLLEGE 

University Honors College<br>1632 SW 12th Ave.<br>503-725-4928<br>www.pdx.e du/honors<br>honors @ pdx.edu

## Honors in the City

University Honors College combines the benefits and rigor of a small liberal arts college with the opportunities and res ources of a large urban research university. The College centrally engages Portland State's mission to "Let Knowledge Servethe City," drawing on PSU's institutional commitment to community engagement, sustainability, and internationalization as wellas its civic leadership and location in downtown Portland. The Honors College serves academically motivated students by providing an engaged and challenging educational experience that uses the city of Portland as a living/learning laboratory. Students in any department or major can join the University Honors College; all Honors students graduate with prestigious University Honors in their chosen field.
Honors at PSU offers courses in the theory and research methods of the human, natural, and social sciences as well as a wide-ranging selection of intensiveinterdisciplinary seminars. Students have the opportunity to work closely with faculty on research projects, network and gain experience through internships, and study abroad with Honors faculty. In their final year, Honors students research and write a baccalaureate Honors thesis.
Engaging faculty fromacross PSU's campus, the University Honors College gives students the opportunity to work with our finest teachers and researchers. Honors students become disciplined, nimble thinkers, prepared to become leaders, and ready to apply their academic learning to the challenges and uncertainties of the real world.

## ADMISSION REQUIREMENTS

Interested students must complete the additional Honors College application questions available as part of the PSU undergraduate application. Current PSU students wishing to transfer into the Honors College should see the Honors website for instructions on completing an application: www.pdx.edu/honors. Students are welcome to transfer into the University Honors College fromoutside institutions or fromwithin PSU at any point in their freshman, sophomore, or junior years. Students wishing to transfer into Honors as seniors should contact the University Honors Director to discuss their research experience and thesis plans.

In order to be admitted to the Urban Honors College, all students must first be admitted to Portland State University.

## Expected criteria for admission:

## First-year students (entering from high school):

- 3.50 cumulative unweighted high school GPA
- Two essays submitted as part of the application
- SAT and ACT scores are accepted but not required


## Transfer/Current PSUstudents:

- Cumulative GPA of 3.25 or higher in college-level courses


## All applications are reviewed holistically by a faculty committee.

## GRADUATION REQUIREMENTS

All Honors students must complete the Honors College curriculumand a senior thesis supervised by a faculty advisor. Honors theses are presented at a public symposiumand are published on PDX.Scholar, PSU's open source thesis and dissertation database.
Honors students mustmeet the undergraduate degree requirements set by the University, including those governing total credits earned, upper division credits, the writing requirement, residencecredit, and degree (BA/BS) requirements, as well as any additional degree requirements set by their major department.
Graduating fromHonors requires a cumulativePSUGPA of 3.25 orhigher and a cumulative 3.25 GPA in all Honors (HON) courses.

## First Year: The Global City ( $\mathbf{1 5}$ credits)

- Hon 101, Hon 102, Hon 103
- The sequence fulfills 8 credits of Arts and Letters and 4 credits in SocialScience
- The sequence fulfills the University's lower division writing requirement, and meets the requirement for WR 121.
- First year students must complete the Global City sequence regardless of the number of AP/IB credits they may have completed.
- Incoming first yeartransfer students with 29 or fewer college credits must complete the Global City sequence.Second Year: Research Methods (12 credits)
- Hon 201, Hon 202, Hon 203
- These three courses fulfill 4 credits in Arts and Letters, 4 credits in Social Science, and 4 credits in sciences respectively. The sequence completes the additional writing course requirement.
- Students entering Honors with 30-89 college credits should begin with the second year curriculum; all three courses are required. It is recommended that transfer students begin with HON 299.Junior Year: Theory \& Practice ( 12 credits)
- Transfer students must begin with the 4-credit Hon 360: Honors Writing for Transfer Students. This course counts towards the 12-credit third year requirement for transfer students entering at the junior levelor above.
- Hon 360: Honors Writing for Transfer Students is an approved Writing Intensive Course (WIC). It fulfills the university's second writing requirement.
- Students are required to take at leastone4-credit Honors Junior Seminar: Hon 407
- The additional 8 credits of Junior requirements may be fulfilled through any combination of Honors s eminars (Hon 407), internships (Hon 404), research (Hon 401), departmental honors seminars, or approved study abroad courses.
- Students entering Honors with $90+$ credits are required to take Hon 360 or its equivalent during their first term in Honors. 12 credits of junior level coursework are also required.Senior Year: Honors Thesis (8 credits)
- Hon 403: Thesis Prospectus (4 credits); Hon 403: Thes is Continuation ( 4 credits); public presentation and defense
- Hon 403: Thesis Prospectus is an approved Writing Intensive Course (WIC). It fulfills the university's second writing requirement.
- Students wishing to transfer into Honors as seniors should contact the Honors College Director to discuss their research experience and plans.

HONORS CURRICULUM

## FIRST YEAR: FOUNDATIONS (15 CREDITS)

The Global City: Hon 101, Hon 102, Hon 103 (15 credits)
This year-long sequence serves as a foundations course and provides the basic intellectual framework for the social, cultural, political, and materials study of the urban environment. "The Global City" introduces the means to think critically about the urbanenvironment and the interdependence between thecity and the global world. The sequence fulfills the university's lower division writing requirement, and meets the requirementfor Wr 121.

Over the course of three terms, this course focuses on developing and refining student understanding and practice of the three writing tools dealt with throughout the Honors curriculum: summary of argument, explication, and placement in relation to a dis course community, as part of the preparation for writing the undergraduate thesis.
While each section of the course will have different material, the writing tools studied throughout the year are the same from section to section. "TheGlobalCity" sequence is taken in a cohort model, with students remaining with the same peers and faculty throughout the academic year. Class size is limited to 24.

## SECOND YEAR: RESEARCH METHODS (12 CREDITS)

Research Methods: Hon 201, Hon 202, Hon 203 (12 credits)

The three connected courses of the sophomore year take the urban as an appropriately dynamic subject for research shaped by the three "domains" of academic knowledge: the social sciences, the humanities, and the natural sciences. Students progress through an integrated set of research projects that develop not only their understanding of the systems by which cities operate but also their own critical capacities as urban residents and knowledge producers. Class size limited to 24.

## Hon 201: Urban Social Sciences

This course examines urban structures and processes through a combination of social science methodologies including, but not limited to, spatial analysis, qualitative and quantitative methods and archival research. Field drawn upon may include sociology, anthropology, geography, and other social sciences. Students will explore and practice these skills by conducting original research in the Portland area.

## Hon 202: Urban Humanities

This course examines the city as text, using humanities methodologies that produce closes analy sis of cultural artifacts and texts placed in cultural and historic contexts. Disciplinary approaches may include History, Languages and Literatures, Art History, Film Studies, Gender Studies, CulturalStudies, and others.

## Hon 203: Urban Ecology

Utilizing Portland as a living laboratory, this course introduces methodologies in the natural sciences. We explore foundations of experimental design while also sharpening observational skills and awareness of physical and ecological patterns and processes in the city. Different focus areas depend upon seasonal activity and include a range of topics such as streamecology, plantscience, and ornithology.

## THIRD YEAR: "LET KNOWLEDGE SERVE THE CITY" (12 CREDITS)

Honors Writing for Transfer Students: Hon 360 (4 credits - counts towards 12-credit third-yearHON requirement)
This 4-credit course is the required entry point for transfer students entering Honors College at the junior level. Hon 360 introduces transfer students to ways of thinking about the urban experience, introduces and develops the basic writing and research tools necessary for upper-level seminar work in Honors and for the senior thesis, and provides working examples of disciplinary scholarship. This is an approved Writing Intensive Course (WIC); it fulfills the university's second writing requirement. Class size limited to 24 .
Honors Junior Seminars: Hon 407 (minimum 4 credits maximum 12 credits)
At least one 4-credit Hon 407 Junior Seminar is required; additional seminars are encouraged. Students choose from among a wide variety of interdisciplinary seminars, taught by Honors and departmental faculty, broadly focused around key methodological and interdisciplinary questions. Seminar clas ses challenge Honors students to think creatively and analytically as well as rehearse the essential research and writing skills necessary for the production of a senior thesis. Clas s size limited to 20.
Honors Abroad: Hon 407 (4credits - 8 credits)
The Honors College offers faculty-led globalHon 407 seminars for Honors students every year. Past trips have investigated cultural and ecological sustainability in Borneo, studied sustainable development in the highlands of Nicaragua, explored globalcities in Vietnam, and examined the history of plague and pestilence in London. These courses fulfill the Hon 407 Junior Seminar requirement.
Internships: Hon 404 (4 credits - 8 credits)
Students have the opportunity to gain experience, apply their academic learning, and make connections through approved cooperative education/internships. During their internship, students must enroll in and complete the online Hon 404: Internship module on D2L. Honors students have in the past interned at OHSU, the U.S. Attorney's office, Portlandia, the National Institutes for Health, the Portland

Art Museum, Mercy Corps, the Beaverton City Library, Willamette Week, and the Smithsonian, among many other organizations.

## Research: Hon 401 (4 credits - 8 credits)

Students are encouraged to join ongoing research projects, conduct independent research, and develop creative projects under the supervision and mentorship of faculty.

## FOURTH YEAR: UNDERGRADUATE THESIS

 (8 CREDITS)Hon 403 Thesis: Prospectus (4 credits)
Hon 403 Thesis: Continuation (4 credits)
Honors students are required to complete a thesis in their major field during their final undergraduate year. Students first take the 4-credit Hon 403 Thes is: Prospectus seminar, in which they identify their advis or and write their thesis prospectus. Upon successful completion of the Prospectus course, the student enrolls in one or more Hon 403 Thes is: Continuation sections, in which they complete their thes is. Finally, the student presents the thesis at the Honors Thesis Symposium. Honors theses are published online through the PSU Library database PDX.Scholar, and are also available in the Undergraduate Research Commons, showcasing undergraduate research from universities nationwide.

Hon 403 Thesis: Prospectus is an approved Writing Intens ive Course(WIC). It fulfills the university's second writing requirement.

## COLLEGE OF LIBERAL ARTS AND SCIENCES

Todd Rosenstiel, Dean
DeLys Ostlund, Associate Dean of Faculty Matt Carlson, Associate Dean of Undergraduate Programs Suzanne Estes, Associate Dean for Undergraduate Engagement
Heejun Chang, Associate Dean for Research \& Graduate Programs

341 Cramer Hall, 503-725-3514
www.pdx.edu/liberal-arts-sciences/
The College of Liberal Arts and Sciences provides an opportunity for students to obtain a liberal education-an education that both broadens and deepens their understanding of the major areas of knowledge and scholarship, and develops their expertise in an area of specialization. A liberaleducation is an education for life. It prepares students to make informed decisions about their lives and to think critically and analytically.

All students-Liberal Arts and Sciences majors as well as those fromprofessional schools and programs-take a selection of courses that represent the three areas of the college: arts and letters, science, and social science. Course offerings range from those designed to provide a foundation for all baccalaureate degrees to those of an advanced, specialized nature.

Acquiring a balanced and integrated liberal education requires planning and consultation with an adviser. Faculty advisers in each department and programare available to help students structure their academic careers so they may get the most from their college experience.

The instructional units of the college include Anthropology (p. 210), Applied Linguistics (p. 214), Biology (p. 218), Black Studies (p.224), Chemistry (p.226), Chicano/Latino Studies (p.230), Communication (p. 231), Conflict Resolution(p.234), English (p.238), Environmental Science and Management (p. 247), Geography (p. 259), Geology (p. 267), History (p. 277), Indigenous Nations Studies (p.283), Judaic Studies (p. 288), Mathematics and Statistics (p. 291), Philosophy (p. 312), Physics (p.313), Psychology (p.326), Sociology (p. 329), Speech and Hearing Sciences (p. 332), Systems Science (p. 336), Women, Gender, and Sexuality Studies (p. 340), and World Languages and Literatures (p. 344).

## Undergraduate programs

## Baccalaure ate Degrees

The College of Liberal Arts and Sciences is a large and diversified unit offering more than 20 majors (some with additional choices of sub-specialization), several academic
certificates and teaching endorsements, and numerous departmental minors.
The college also offers a selection of alternative programs for students who are highly motivated and who have a record of high scholarly achie vement. Students may obtain information concerning any one of several departmental honors tracks from the participating department. These programs generally allow an accelerated exposure to higher education, thereby broadening the experience of the student.
All majors in the College of Liberal Arts and Sciences, along with University and generaleducation requirements, lead to a bachelor's degree. Requirements for each major are listed under the appropriate department. Students wishing to emphasize a broad study in arts and letters, liberal studies, science, or social science may do soby exploring the Interdisciplinary Studies: Arts and Letters, Liberal Studies, Science, and Social Science (p. 286) programs.

## Certificates

Specialized undergraduate and graduate academic certificates are offered by the following units in the College of Liberal Arts and Sciences: the School of Gender, Race, and Nations; Applied Linguistics; Black Studies; Chicano/LatinoStudies; Conflict Resolution; English; Environmental Science and Management; Geography; Geology; Indigenous Nations Studies, Mathematics; Speech and Hearing Sciences, Sy stems Science; Women, Gender, and Sexuality Studies; and W orld Languages and Literatures. Requirements for these certificates are listed under the appropriate department.

## Minors

The following departments and programs in the College of Liberal Arts and Sciences offer academic minors: Anthropology; Applied Linguistics; Biology;Black Studies; Chemistry; Chicano/LatinoStudies; Communication; Conflict Resolution; English; Environmental Science and Management; Geography; Geology; History; Indigenous Nations Studies; Judaic Studies;Mathematics and Statistics; Philosophy; Physics; Pre-Education (Elementary Education, Elementary Science, Secondary Education, and SpecialEducation), Psychology; Sociology; Sy stems Science, W omen, Gender, and Sexuality Studies; and World Languages and Literatures. Students majoring in a field of study outside Liberal Arts and Sciences also may declare an academic minor in one of these programs. The requirements for these minors are indicated within the appropriate department sections of this Bulletin.

## DEGREE MAPS AND LEARNING OUTCOMES

To view the degree maps and expected learning outcomes for the College of Liberal Arts and Science's undergraduate degrees, go to www.pdx.edu/academic-programs/a-z.

## HIGH SCHOOL COLLEGE PROGRAMS

## 503-725-3430

Joy Beckett, Director
Stephanie Gustafson, ProgramCoordinator
Sarah Holliday, Event Coordinator

## Challenge Program

The Challenge Programis a cooperative programbetween Portland State University and metropolitan area high schools. It provides eligible high school juniors and seniors an opportunity to take regular PSU college courses on their own campuses at reduced cost.
Students who have a minimum cumulative grade point average of 3.00 and have met course prerequis ites are eligible to enroll in Challenge courses offered in their high school.

The Challenge Programcurrently offers introductory college courses in Chemistry, English, Geology, History, Mathematics, Philosophy, W orld Languages and Literatures, PSU Honors, and Computer Science. Course content is equivalent to that offered to Portland State University students on the home campus. College-level texts and materials are used.

Students who complete their Challenge Program cours ework are entitled to a regular Portland State University transcript. The credit earned by the studentcan be transferred to many colleges and universities regionally and nationally.
More information is available at
http://www.pdx.edu/challenge-program.

## Graduate programs

There are many options available for graduate study within the College of Liberal Arts and Sciences. Students may specialize in any one of the many master's programs or doctoral programs.

## Master of Arts and Master of Science programs

Master of Arts and Master of Science degrees are designed for the student who wishes to conduct advanced studies in a particular discipline. Generally the programs are flexible enough forstudents, with the aid of an adviser, to design a programof study that allows them to pursue their particular interest. The requirements of each discipline are lis ted under the departments that have the M.A./M.S. option available.

## Doctoral Programs

Departments in the College of Liberal Arts and Sciences that offer doctoral programs include Biology, Chemistry, Mathematics, Physics, Ps ychology, and Sociology. Many other departments participate in one or more multidisciplinary doctoral programs: Earth, Environment, and Society; Systems Science; and Urban Studies. The doctoral degree is for the person who wants the most advanced academic degree, generally with a life-long objective of expanding the scope of knowledge of a specialized field of study. The specific requirements of each available option are listed under the participating departments and programs.

## Earth, Environment and Society Ph.D.

## EARTH, ENVIRONMENT AND SOCIETY PH.D.

The Earth, Environment, \& Society (EES) doctoral programprovides an opportunity for the student to engage in relevant research while acquiring advanced academic training in Environmental Science and Management, Geography, or Geology. One of the goals of the programis to provide a broadly based understanding of oneof the above the fields coupled with scientific training in one or more specialty areas. The student will follow a programof study and research approved by the EES program. The graduating student will be awarded a degree in Earth, Environment, \& Society.

## ADMISSION REQUIREMENTS

Applicants for admis sion to the Earth, Environment, \& Society (EES) doctoral programnormally will be expected to have completed a Bachelor's or Master's degree in a related field that will have prepared them to become engaged in state-of-the-art research.

## DEGREE REQUIREMENTS

In addition to the requirements listed above, each student must complete the following.

At least 81 credits past the bachelor's degree and the following courses:

## Course requirements

- Four credits of seminar, which may be satisfied by any combination of ESM/G/Geog 507 Speakers Series, ESR 655/ESR 656/ESR 657 Professional Prep series, Research Group Seminars at the departmental 500 level, and Journal Clubs offered in the student's area at the departmental 500 level(4 credits);
- Two credits of professional development, ESR 655 and ESR 656 or other similar courses recommended by the Advis ory Committee and subject to approval by the

EES doctoral programdirector (2 credits);

- One course in research methods, such as ESM 566, ESM 567, G 523, Geog 525, Geog 597, Geog 694, USP 683, Soc 592 or other similar course recommended by the Advisory Committee and subject to approval by the EES doctoral programdirector (3-4 credits);
- Dis sertation credits (27 credits).

Subtotal: 36-37
Substitutions for the courses listed above may be granted by petitioning the EES doctoral programdirector. Subtotal: 36-37

## ADDITIONAL REQUIREMENTS

In addition to the general requirements, each student will be required to complete any coursework necessary to indicate competence in environmental scholarship at the graduate level, as determined by the Advisory Committee. It is required that all EES doctoral students take at least one 1-credit seminar course (as defined above) for every term they're in residence until advancing to candidacy.

## Dissertation

The student must submit a pros pectus outlining a proposed research project suitable for the doctoral dis sertation in Earth, Environment, \& Society. This is done under the guidanceof the student's adviser and is approved by the Dis sertation Committee and the Director of the Earth, Environment, and Society doctoral program. The research for the dis sertation is conducted under the guidance of the student's dis sertation committee. After the dissertation is complete and after advancement to candidacy (see below), a final oral defense will be conducted, open to the public, within the subject area of the dissertation.

## Advancement to candidacy

As soon as the student has successfully completed the course and comprehensive examination requirements and has had the dissertation prospectus approved, the student is recommended for advancement to candidacy for the degree of Doctor of Philosophy. This recommendation is approved by the dean of Graduate Studies.

## Financial support

There are a limited number of teaching assistantships and research assistantships available that are offered through the College and through the constituent departments (ESM, Geography, Geology).

## Withdrawal

Any student who ceases to be enrolled for more than one academic term without formal leave of absence will be
as sumed to have with drawn from the degree program and will be formally dropped fromit. Students who fail to make satis factory progress toward the degree may be dropped from the program.
The student can be readmitted only by formal application, subject to all current admis sion requirements. In addition, completion of the degree will be subject to the student's meeting all current degree requirements.

## Leave of absence

Under special circums tances, requests for a leave of absence may be approved.

## School of Gender, Race, and Nations

150 Parkmill (PKM)
503-725-9093
www.pdx.edu/gender-race-nations/

- Graduate Certificate in Gender, Race, and Nations

The School of Gender, Race and Nations (SGRN) is comprised of four units: Black Studies (p. 224), Chicano/LatinoStudies (p.230), Indigenous Nations Studies (p.283), and Women, Gender, and Sexuality Studies (p.340). This collaboration is interdisciplinary at its core. The overarching areas evident in the school's name feature the rich constellation of interlocking and challenging factors key to understanding our society and making changes for a more socially just future. Our goal is to create a spaceforexcellence in studies and research of culture, race, ethnicity, sovereignty, nation, migration, class, gender and sexuality. The School of Gender, Race and Nations offers a graduate certificate (p.210). Those who enroll in the GRN certificate programinclude those from existing graduate programs and professionals seeking additional grounding in such studies.

These are the programs offered in the four SGRN units. Full details can be found on their individual websites.

Black Studies (p. 224)

- B.A., B.S. in Black Studies
- Minor in Black Studies
- Post Baccalaureate Certificate in BlackStudies

Chicano/LatinoStudies (p. 230)

- Minor in Chicano/Latino Studies
- Certificate in Chicano/Latino Studies

Indigenous Nations Studies (p. 283)

- B.A., B.S. in Indigenous Nations and Native American Studies
- Minor in Indigenous Nations Studies
- Certificate in Indigenous Traditional Ecological \& Cultural Knowledge

Women, Gender, and Sexuality Studies (p.340)

- B.A., B.S.-Women's Studies
- B.A., B.S.-Sexuality, Gender, and QueerStudies
- Minor in Women's Studies
- Minor in Sexuality, Gender, and Queer Studies
- Postbaccalaureate Certificate in Women's Studies

GENDER, RACE, AND NATIONS GRADUATE CERTIFICATE

## CERTIFICATE REQUIREM ENTS

## Core Courses ( 8 credits)

GRN 515 Constructions of Power and
Knowledge: Gender, Race, and Nations
GRN $520 \quad$ Critical and Decolonizing
Research Methodologies
Approved Electives (16 credits)
GRN 530 Social Justice Pedagogy
GRN 550 Seminar in Gender, Race, and Nations
BSt 5XX All 500-level courses in Black Studies
ChLa 5XX All 500-level courses in Chicano/LatinoStudies
NAS 5XX All 500-level courses in Indigenous Nations Studies
WS 5XX All 500-level courses in Women,
Gender, and Sexuality Studies
Other adviser-approved courses

Subtotal: 24

## Anthropology

141 Cramer Hall (CH)
503-725-3361
www.pdx.edu/anthropology

- B.A., B.S.
- Bachelor's + Master's Program
- Minor in Anthropology
- Secondary Education Program-Social Science
- M.A.,M.S.

Anthropology is the study of biological and cultural diversity across time and space, fromthe primates and our bipedal ancestors to human societies in prehistory and the modern world. As anthropologists, we have a keen understanding of the complexities of our past, the interconnections between biology and culture, and the urgent social problems of our times.
Students can develop their expertise in topics such as cultural heritage, human-environment interactions, climate change, and biodiversity conservation, design and user experience, , structural racism, violence, migration, primatology, gender and sexuality, food systems, globalization, and human health and medicine. Students gain knowledge and skills through a variety of clas sroom, online, lab and internship opportunities. This experience prepares students for careers with federal and state agencies, NGOs, tribes, public/community health org anizations, biomedical research institutions, consulting firms, activist groups, museums, corporations, academia and more.
Our department supports three subfields: archaeology, sociocultural anthropology, and biological anthropology. Our regional specializations lie in Madag ascar, Asia, Latin America, the Arctic, and western North America. We are dedicated to applied research and scholarship that addresses real world is sues through problemsolving and the co-creation of knowledge and solutions with the communities where research and interventions are conducted.
Central to our collective endeavors is critically reflecting on the colonial histories and epistemologies of anthropology as an academic discipline and profession. We are committed to including a plurality of theoretical and methodological perspectives in ourpedagogy, particularly those of non-Western and underrepresented scholars. Our research practices advance collaborative, participatory, and praxis-based approaches that decenter authority in knowledge production. We prioritize engaging with practitioner communities, extending anthropological knowledge and insights beyond the academy, and expanding diversity within the faculty, student body and discipline as a whole.

## Undergraduate program

## DEGREE MAPS AND LEARNING OUTCOMES

To view the degree maps and expected learning outcomes for Anthropology's undergraduate degrees, go to www.pdx.edu/academic-programs/a-z.

Admission to the department is based on general admission to the University. See Admis sions Requirements (p. 8) for more information.

## Limitations

Students majoring in anthropology should consult a department adviser no later than the beginning of the junior year. Selection of appropriate courses to supplement the student's major work should be made in consultation with the adviser. No student majoring in anthropology will be permitted to offer more than 72 credits of work in anthropology for the bachelor's degree. This limitation will be waived only through petition to the department.

## ANTHROPOLOGY B.A./B.S.

## REQUIREMENTS

In addition to meeting the general University degree requirements, the anthropology major must meet minimum departmental requirements as follows:

| Courses <br> Anth 101 | Introduction to Biological <br> Anthropology | 4 |
| :--- | :--- | ---: |
| Anth 102 | Introductionto Archaeology <br> Anth 103 | 4 |
|  | Introductionto Social/Cultural <br> Anthropology | 4 |
| Anth 304 | Identity and Society <br> or <br> Culture and Power | 4 |
| Anth 305 |  | 4 |
| Anth 345 | Practicing Anthropology <br> Anth 350 | ArchaeologicalMethod and <br> Theory |
| Anth 350L | ArchaeologicalMethod and <br> Theory Laboratory | 4 |
| Anth 370 | Paleoanthropology <br> or | 1 |
| Anth 372 | Human Variation <br> or <br> Primate Ecology and Behavior | 4 |
| Anth 373 | Languageand Society | 4 |
| Ling 232 | or <br> or | 4 |
| Ling 233 | Languageand Mind <br> or <br> Introductionto Linguistics <br> or | 4 |
| Ling 390 | 4 |  |
| Stat 244 | Introductionto Probability and <br> Statistics II | 4 |

Students earning the B.S. are required to take Stat 244

NOTE: Anthropology B.A. majors must complete two years of a foreign language or demonstrate equivalent proficiency.
Subtotal: 53-54

## ELECTIVE REQUIREMENTS

Students are required to take 20 upper division elective credits including at least one methods course (i.e., Anth 412, Anth 415, Anth 452, Anth 453, Anth 454, Anth 455, Anth 477, Anth 478, Anth 479). At least 12 of the 20 credits must be in 400 -level courses. Four of the 20 credits may be in omnibus numbered-courses (i.e., Anth 401, Anth 404, Anth 405, Anth 407), and four of the 20 credits may be in 200-level Anthropology courses approved by the Department.
Four of the required 20 elective credits may be taken on a pass/no pass basis; all other anthropology courses used to satisfy the departmental major requirements must be taken for a letter grade and must havebeen assigned a grade of C- orbetter. Courses taken outside the department as part of departmental requirements (i.e. Ling 232, Ling 233, Ling 390 or Stat 244, World Languages and Literatures courses) may be taken pass/no pass (subject to the University limitations on the maximum number of hours taken pass/no pass) or for a letter grade. However, students who take thesecourses for a letter grade must earn a C-or better. Students mustearn a cumulative grade point average of 2.00 or better in all courses required for the anthropology bachelor's degree (including those courses taken outside the department as part of departmental requirements).

## ANTHROPOLOGY BACHELORS + MASTER'S PROGRAM

Students currently enrolled in the BA or BS in Anthropology may be admitted directly into the MA or MS Anthropology programand share up to 20 credits of graduate level credit with the BA/BS and MA/MS in Anthropology.
Students can apply for the Bachelors + Masters in their junior or senior year. If admitted, students are eligible to take 500-level courses during their junior and/or senior years. For more information on applications or the Bachelor's + Master's program, see Anthropology B+M Programor email anthdept@pdx.edu.

ANTHROPOLOGY MINOR

## REQUIREMENTS

To earn a minor in anthropology a student must complete 28 credits ( 12 credits of which must be taken in residence at PSU), to include the following:

| Courses <br> Anth 101 | Introduction to Biological <br> Anthropology | 4 |
| :--- | :--- | ---: |
| Anth 102 | Introductionto Archaeology | 4 |
| Anth 103 | Introductionto Social/Cultural <br> Anthropology | 4 |
| Ane of the following courses: (4-5 credits) |  |  |

The Department of Anthropology offers the degrees of Master of Arts and Master of Science. The programis designed to give thestudent a graduate level of competence in general anthropology, including the major subfields of biological anthropology, archaeology, and social-cultural anthropology. At the same time, the programwill permit the student to pursue a special interest in one of the subfields. Students havethe option of choosing from three tracks: a thesis track, an internship track, or a skills track. The thes is track candidate is required to do research in an area of special interest and prepare a thesis based upon it. The internship and skills tracks are designed to prepare students for professional employment related to applied anthropology. Students in the internship track will complete an internship and a thesis that combines an internship deliverable and a final internship paper. Students in the skills track will take 7 additional hours of coursework, complete comprehensive exams, and submit a portfolio that documents the skills
they obtained during the program. For more information, interested students are urged to go to the Department's Web site: www.pdx.edu/anthropology.
The master's programhas been planned for students who hold an undergraduate degree in general anthropology or its equivalent in course coverage. For students with this preparation, the master's degree, including res earch and thes is, may be completed in two to three years. Graduate applicants who lack an undergraduate major in Anthropology may be admitted to the program, but completion of the degree may require a more extended period of study. Students without an adequate background in anthropology will be required to take selected undergraduate courses to remove deficiencies. These courses normally do not offer graduate credit.

## ADMISSION REQUIREMENTS

For admiss ion to graduate study, the student must havea minimum of a 3.25 grade point average in anthropology courses and an overall GPA of 3.00. In addition, the applicant mustsubmit GRE scores, a 500 -word statement indicating why he orshe is interested in pursuing a graduate degree in anthropology, and a sample of written work (e.g., a term paper). All applicants must also arrange to have three letters of recommendation indicating professional promise addressed to the Department's Graduate Admis sion Committee. To facilitate scheduling of graduate courses, students ordinarily are admitted for fall term only.

ANTHROPOLOGY M.A./M.S.

## THESIS TRACK

Of the 45 required credits, 32 must be in anthropology and must include:

## Courses

| Anth 511 | Core Seminar in Social and <br> Cultural Anthropology | 4 |
| :--- | :--- | :--- |
| Anth 550 | Core Seminar in Archaeology <br> Anth 570 <br> Core Seminar in Physical | 4 |
|  | Anthropology | 4 |
|  | Graduate-level Anthropology <br> electives (2 courses) | 8 |
|  | Approved graduate-level <br> electives (Anth, non-Anth) | 9 |
|  | An adviser-approved, graduate- | 4 |
| levelcourse in research methods |  |  |, 4

Anth 511, Anth 550, Anth 570: Students may substitute an additional elective course for one of the core courses, with the approval of their adviser.

Graduate-levelElectives: At least two of these courses (8 credits ) must be in formally numbered graduate-level courses (i.e. courses numbered between Anth 510-Anth 597 or Anth 610-Anth 697). With graduate adviser approval, the remaining 9 credits may be in courses numbered 504 or 505 (i.e. Internship, Reading and Conference).

Adviser-approved Research Methods course: This course must be formally numbered and described in the PSU Bulletin. It may not be a course numbered 501/601, 502/602, 503/603, 504/604, 505/605, 506/606, 507/607, 508/608, 509/609.
Subtotal: 45

## INTERNSHIP TRACK

Of the 45 required credits, 32 must be in anthropology and must include:

## Courses

| Anth 511 | Core Seminar in Social and <br> Cultural Anthropology | 4 |
| :--- | :--- | :--- |
| Anth 550 | Core Seminar in Archaeology <br> Anth 570 | 4 |
| Anth 515 | Anthropology | 4 |
|  | Applied Anthropology <br> Graduate-level Anthropology <br> electives (2 courses) | 4 |
|  | Approved graduate-level <br> electives (Anth, non-Anth) | 8 |
|  | An adviser-approved, graduate- <br> levelcourse in research methods | 4 |
| Anth 503 | Thesis Internship Track | 4 |
| Anth 504 | Cooperative Education/Internship | 6 |

Anth 511, Anth 550, Anth 570: Students may substitute an additional elective course for one of the core courses, with the approval of their adviser.
Graduate-levelElectives: At least two of these courses (8 credits ) must be in formally numbered graduate-level courses (i.e. courses numbered between 510-597 or 610697). With graduate adviser approval, the remaining 9 credits may be in courses numbered 504 or 505 (i.e. Internship, Reading and Conference).

Adviser-approved Research Methods course: This course must be formally numbered and described in the PSU Bulletin. It may not be a course numbered 501/601, 502/602, 503/603, 504/604, 505/605, 506/606, 507/607, 508/608, 509/609.
Subtotal: 45

## SKILLS TRACK (COMPREHENSIVE EXAMS + PORTFOLIO)

Of the 52 required credits, 32 must be in anthropology and must include:

| Anth 511 | Core Seminar in Social and <br> Cultural Anthropology | 4 |
| :--- | :--- | ---: |
| Anth 550 | Core Seminar in Archaeology <br> Anth 570 | 4 |
|  | Core Seminar in Physical <br> Anthropology | 4 |
|  | Graduate-level Anthropology <br> electives (3 courses) | 12 |
|  | Adviser-approved, graduate-level <br> methods electives (3 courses) | 12 |
|  | Graduate-levelNon- | 8 |
| Anth 506 | Anthropology electives (2 <br> courses) <br> SpecialProjects (Comprehensive | 8 |
|  | Exams + Portfolio) | 8 |

Anth 511, Anth 550, Anth 570: Students may substitute an additional elective course for one of the core courses, with the approval of their adviser.

Graduate-levelElectives: At least two of these courses (8 credits) must be in formally numbered graduate-level courses (i.e. courses numbered between 510-597 or 610697). With graduate adviser approval, the remaining course ( 4 credits) may be in cours es numbered 501-505 and 507509).

Adviser-approved Research Methods course: This course must be formally numbered and described in the PSU Bulletin. It may not be a course numbered 501/601, 502/602, 503/603, 504/604, 505/605, 506/606, 507/607, 508/608, 509/609.
Subtotal: 52
Four calendar years from the term of admis sion will be the maximum time allowed to complete all requirements for a master's degree. Terms on approved leave of absence will be charged against the four-year limitation.

In addition to formal course requirements, the following are also necessary:

1. Candidates for an MA degree must fulfill the second language requirement. Options for meeting the graduate foreign language requirement forMA students include: A) Pas sing a course equivalent to PSU level 203 or higher. The Department of W orld Languages and Literatures will verify completion of the requirement upon evaluation of the student's academic record. B) Students who do not meet the course equivalentshould contact the Department of World Languages and Literatures during the first termafter their admis sion to schedule an oral proficiency interview or a written test. Ordinarily the examination is taken in French, Spanish, or German. Other languages may, upon departmental approval, be substituted. Students must complete the foreign language requirement no later than one calendar year
following entrance to the program. Foreign Language Requirement Verification Request Forms should be submitted for completion to the Department of W orld Languages and Literatures and a copy should be given to the Anthropology Department.
2. Candidates for an MS degree are strongly encouraged to discuss with their advisers the selection of appropriate courses in science, math, and technical skills that would complement their course of study.
3. Advancement tocandidacy involves successful passing (a minimum grade of B-) of the core seminars (Anth 511, Anth 550, Anth 570). Advancement to candidacy can only be accomplished before the close of the next-to-the-final termof work.
4. For the thes is track, approval of a thes is topic and the appointment of the graduate committee. For the internship track, approval of an internship contract (including deliverables), a final paper topic and format, and the appointment of the graduate committee. For the skills track, approval of a course plan, portfolio content, and the appointment of the graduate committee. Students develop a thesis proposal (thesis track), internship contract and final paper score (internship track), or coursework/portfolio plan (skills track) and submit it to the department faculty for approval and for the formal appointment of the graduate committee. Students in the thesis track should have a master's thesis proposal submitted to and approved by the department faculty as soon as possible following admis sion to the program, but in no case later than the end of the seventh term (excluding Summer Session) following admission to the program. Students in the internship track should have an approved internship contract as soon as possible following admis sion into the program, but in no case later than the end of the fifth term(excluding Summer Session). Students in the skills track should have an approved course plan by theend of their first quarter in the program.
5. Forstudents on the internship track, submission of internship deliverable to partnership organization and presentation and approval of the final internship paper.
6. Forstudents on the thesis track, presentation and approval of thes is and passing of an oral defense of thes is.
7. For students on the skills track, pas sing comprehensive exams, submitting and presenting an approved portfolio that demonstrates the skills obtained during the program.

## Applied Linguistics

Applied Linguistics
University Center Building (UCB), Suite 335

503-725-2040
www.pdx.edu/applied-linguistics

- B.A. in Applied Linguistics
- Minor in Applied Linguistics
- Certificate in Teaching English as a Second Language (TESL)
- M.A. in Teaching English to Speakers of Other Languages (MA TESOL)


## Applied Linguistics programs

The Department of Applied Linguistics offers a B.A. in Applied Linguistics, a minor in Applied Linguistics, a Certificate in Teaching English as a Second Language (TESL), and an M.A. in Teaching English to Speakers of Other Languages (MA TESOL).

The B.A. major in Applied Linguistics provides a strong foundation in both analytical and communication skills while building students' understanding of the structure and use of human languages. It also serves as strong preparation for graduate study. A minor in Applied Linguistics allows students to integrate language analysis skills and a bas ic knowledge of language structure into a major in anotherfield. The Certificate in Teaching English as a Second Language provides thorough undergraduatelevel preparation for teaching. The M.A. TESOL provides graduate-level preparation for teaching, language consulting, and research.

## Undergraduate programs

## DEGREE MAPS AND LEARNING OUTCOMES

To view the degree maps and expected learning outcomes for Applied Linguistics' undergraduate degrees, go to www.pdx.edu/academic-programs/a-z. Terms of course offerings may change. Check the department website: https://www.pdx.edu/applied-linguistics/course-schedule

## APPLIED LINGUISTICS B.A.

## Admission requirements

Admission to the department is based on general admission to the University. See Admis sions Requirements (p.8) for more information.

## REQUIREMENTS

In addition to meeting the general University requirements for the B.A. degree, majors must complete an adviserapproved programto include the following:
Required Courses
36 credits
\(\left.$$
\begin{array}{ll}\text { Adviser Approved Electives } & \begin{array}{l}16 \\
\text { credits }\end{array} \\
\begin{array}{l}\text { Typologically Different Language from }\end{array}
$$ \& 8 credits <br>

English/Language Structure Requirement\end{array}\right]\)| Total credits for Applied Linguistics B.A. |
| :--- | | $\mathbf{6 0}$ |
| :--- |
| major |

## REQUIRED COURSES 36 credits

| 300-level courses |  |  |
| :---: | :---: | :---: |
| Ling 390 | Introduction to Linguistics | 4 |
| Ling 391 | Introduction to Applied Linguistics | 4 |
| Ling 392 | Structure of the English Language | 4 |
| 400-level courses |  |  |
| Ling 407 | Senior Seminar | 4 |
| Ling 411 | Syntax | 4 |
|  | or |  |
| Ling 412 | Phonology | 4 |
| Ling 414 | Linguistic Pragmatics | 4 |
|  | or |  |
| Ling 416 | Discourse Analysis | 4 |
| Ling 415 | Linguistic Phonetics | 4 |
| Ling 435 | Theories and Practicein Applied Linguistics | 4 |
| Ling 437 | First Language Acquisition | 4 |
| Ling 438 | Second Language Acquis ition | 4 |

## NOTE: Students should consult with the departmental undergraduate adviser to determine which of the paired options above is the more appropriate choice for their program of study.

## ADVISER APPROVED ELECTIVES 16 credits

Students should meet with the departmental undergraduate adviser to determine which options are most appropriate for them. Students interested in general applied linguistics should choose fromLing 409, Ling 414, Ling 416, Ling 418 , Ling 419, Ling 432, Ling 433, Ling 445, Ling 470, Ling 472, Ling 476, Ling 480, Ling 481,Ling 482, and Ling 490. Students interested in theoretical or structural linguistics should choose fromLing 411, Ling 412, Ling 414 , Ling 416, Ling 418, Ling 420, Ling 432, Ling 433, Ling 445 , Ling 476, Ling 480, Ling 482, and Ling 490. Students interested in language use in the classrooms hould choose fromLing 409 , Ling 416 , Ling 439 , Ling 470 , Ling

472, Ling 473, Ling 476, Ling 480, Ling 481, and Ling 490. Ling 410 requires prior adviser approval.

At least 8 of the 16 elective credits are required to be from PSU Linguistics courses. For a course not taken in PSU Linguistics to counttoward the major, students must get approval fromthe chair or the departmental undergraduate adviser.

Students planning to complete the TESLcertificate concurrently with the BA or to enter the MA TESOL programafter the BA should work with an adviser to carefully plan their program.

## TYPOLOGICALLY DIFFERENT LANGUAGE FROM ENGLISH / LANGUAGE STRUCTURE REQUIREMENT 8 credits

All students must complete one of the three following requirements:

1. Take 2 terms of a single language that is typologically different fromEnglish (choose from: Arabic, ASL, Chinese, Hebrew, Japanese, Korean, Persian, Russian, Swahili, or Turkish).
2. Take 2 classes that focus on language structure across languages:

| Ling 418 | Linguistic Morphology | 4 |
| :--- | :--- | :--- |
| Ling 419 | Language Typology | 4 |
| Ling 420 | Historical and Comparative | 4 |
|  | Linguistics |  |
| Ling 481 | World Englishes | 4 |
| Ling 482 | Pidgins and Creoles | 4 |
| Ling 410 | Selected Topics | 4 |
| Ling 410 requires prior adviser approval |  |  |

3. Take one termof a typologically different language and one language structure class.

All courses used to satisfy the department major requirements must be graded Cor above. Courses taken pass/no pass are not acceptable toward fulfilling department major requirements. By the end of the first quarter of admis sion to the program, students must consult with the adviser to select the appropriate courses. On completion, the entire programmust also be approved by the undergraduate adviser.

APPLIED LINGUISTICS MINOR

## REQUIREMENTS

To earn a minor in applied linguistics a student must have a major in another department and must complete 28 adviser-approved credits (at least 24 credits of which must be taken in residence at PSU), to include the following:

## Courses

## 28 credits

Ling 390
Introduction to Linguistics
Linguistics electives
All linguistics electives require prior approval by the departmental undergraduate adviser. At least 20 of the 24 elective credits are required to be fromPSU Linguistics courses. A maximum of 4 of the 24 elective credits may come from linguistics-focused coursework in anotherPSU department.

All courses used to satisfy the department minor requirements must be graded Cor above. Courses taken pass/no pass are not acceptable toward fulfilling department minor requirements.

## TEACHING ENGLISH AS A SECOND LANGUAGE (TESL) CERTIFICATE

The TESL Certificate provides undergraduate-level preparation to teach English to speakers of other languages. It is especially usefulfor people who want to teach in non-university settings internationally or limited situations in the U.S. The TESL Certificate also combines well with a major in a language-related field such as Applied Linguistics, World Languages and Literatures, Communication, Education, and other social sciences. Students may enroll in the program as undergraduates or as post-baccalaureate students.

## Admission requirements

1. Admis sion to Portland State University.
2. English proficiency in spoken and written Eng lish if the studentdid not graduate from an English-medium secondary school (a TOEFL score report of 80 iBT or higher, an IELTS band score of 6.5 or higher, or a PTE Academic score of 53 or higher is required for proof of proficiency).
3. One year proficiency in at least one foreign language if the student is a native s peaker of English. (Note: If not fulfilled at the time of admission, this requirement can be fulfilled concurrently with the Certificate courses).

## COURSE REQUIREMENTS

In addition tofulfilling minimum University requirements, the following courses are required:

## Courses

## 28 credits

Ling 390
Introduction to Linguistics
Ling 392
Structure of the English

Ling 438
Second Language Acquisition

| Ling | Understanding the International | 4 |
| :--- | :--- | :--- |
| 471/Int1 471 | Experience |  |
| Ling 477 | TESOL Methods I | 4 |
| Ling 478 | TESOL Methods II | 4 |
| Ling 409 | Language Teaching Practicum | 4 |

All courses used to satisfy the certificate requirements must be graded Cor above. Courses taken under the undifferentiated grading option $(\mathrm{P} / \mathrm{NP})$ are not acceptable for department requirements. Before the end of the first quarter in the program, the student is required to consult with the departmental advis er to select the appropriate course sequence.

## Graduate program

## MASTER'S IN TEACHING ENGLISH TO SPEAKERS OF OTHER LANGUAGES (MA TESOL)

The MA TESOL degree prepares its recipients for teaching English to speakers of other languages and other languagerelated professions. The MA is increasingly the degree expected for teachers both in the United States and abroad, where it is generally a requirement for univers ity-level teaching.

## Admission Requirements

1. Admis sion to graduatestudy at Portland State University.
2. Admis sion to the MATESOL program. See the department website for application information (www.pdx.edu/applied-linguistics).
3. Proficiency in English. If the student is not a native speaker of English and doesn't hold a valid B.A. degree or equivalent froman English-mediumuniversity, a minimum TOEFL iBT score of 100, IELTS 7.0, or Pearson Testof English (PTE) score of 68 is required for admission. The M.A. TESOL programdoes not accept the DuoLingoEnglish Test forevidence of proficiency. Alternatively, students can be admitted after completing Portland State's Intensive English Language Program(IELP) with a GPA of 3.5 and receiving a recommendation for graduates tudy from the IELP.

Pers ons interested in applying for the MA TESOL Programshould write to the Department of Applied Linguistics at linginfo@pdx.edu orvisit the department's website at www.pdx.edu/applied-linguistics for additional information. Regular information sessions are held for prospective students. Contact the department for details.

## DEGREE REQUIREMENTS

Students must meet with an adviser regularly, starting in the first term of the program. In addition to the minimum graduate school requirements, students must have an adviser-approved programthat meets the criteria below. (For those students who have completed theCertificate in TESL, adviser-approved courses will be used to substitute for some of the following requirements.)

Each student will complete a totalof $48-50$ credits : 20 credits of required courses, 24 credits of additional cours ework fromone of the three tracks listed below, and 4-6 credits of culminating experience. The three tracks are:
(1) MA TESOL - Standard Track, (2) MA TESOL Language Assessment Not Required, (3)MA TESOL with focus in Applied Linguistics. Based on their professional goals and previous experience, and in consultation with their adviser, students choose one of the three tracks.

For all tracks, students must complete either a four-credit Culminating Works hop course (Ling 566), in which they prepare their professional portfolio based on work throughout their MA, or a six-credit Thesis (Ling 503). All electives mustbe adviser approved.
Overview of Course Requirements for MA TESOL Tracks

|  | Track 1: <br> TESOL - <br> Standard <br> Track | Track 2: <br> TESOL - <br> Language <br> Assessment <br> Not <br> Required | Track 3: <br> TESOL - <br> Applied <br> Linguistics |
| :---: | :---: | :---: | :---: |
| Foundations of Language Structure and Use | $12$ <br> credits | 12 credits | 16 credits |
| Language <br> Education | 20 credits | 16 credits | 8 credits |
| Electives | 8 credits | 12 credits | 16 credits |
| Research and Culminating Experience | 8 credits or 10 credits if thesis option | 8 credits or 10 credits if thesis option | 8 credits or 10 credits if thesis option |

Total credits for all tracks: 48 credits or 50 credits with thes is option

## TRACK 1: TESOL - STANDARD TRACK

Foundations of Language Structure and Use: Required Courses
Ling 513 Applied Phonetics and 4 Phonology
Ling 521 Applied English Grammar 4
Ling 531 Language, Identity, and Culture 4
Language Education: Required Courses
Ling 538 Second Language Acquisition 4
Ling 577 TESOL Methods I 4
Ling 578 TESOL Methods II 4
Ling 539 Language Assessment 4
Ling 509 LanguageTeaching Practicum 4
Elective Courses
1 Language UseElective 4
1 Language Education Elective 4
Research and Culminating Experience
Ling 565 Research in Language Teaching 4 and Applied Linguistics

Ling 566 Culminating Workshop for
TESOL and Applied Linguistics
or
Ling 503 Thesis
6
TRACK 2: TESOL - LANGUAGE ASSESSM ENT NOT REQUIRED

Foundations of Language Structure and Use: Required Courses
Ling 513 Applied Phonetics and 4
Phonology
Ling 521 Applied English Grammar 4
Ling 531 Language, Identity, and Culture 4
Language Education: Required Courses
Ling 538 Second Language Acquisition 4
Ling 577 TESOL Methods I 4
Ling 578 TESOL Methods II 4
Ling 509 LanguageTeaching Practicum 4
Elective Courses
1 Language UseElective 4
1 Language Education Elective 4
Any graduate-level Ling course 4
Research and Culminating Experience
Ling 565 Research in Language Teaching 4
and Applied Linguistics
Ling 566 Culminating Works hop for
4
TESOL and Applied Linguistics
or
Thesis
6

## TRACK 3: APPLIED LINGUISTICS

| Foundations of Language Structure and Use: RequiredCourses |  |  |
| :---: | :---: | :---: |
|  |  |  |
| Ling 513 | Applied Phonetics and | 4 |
|  | Phonology |  |
| Ling 521 | Applied English Grammar | 4 |
| Ling 531 | Language, Identity, and Culture | 4 |
| Ling 516 | Discourse Analy sis | 4 |
| Language Education: Required Courses |  |  |
| Ling 538 | Second Language Acquis ition | 4 |
|  | 1 Language Education Elective or | 4 |
| WLL 598 | Methods of Teaching Foreign Languages | 4 |
| Hective Courses |  |  |
|  | 4 graduate-levelLing courses | 16 |
| Research and Culminating Experience |  |  |
| Ling 565 | Research in Language Teaching and Applied Linguistics | 4 |
| Ling 566 | Culminating Workshop for TESOL and Applied Linguistics or | 4 |
| Ling 503 | Thes is | 6 |
| LANGUAGE USE AND LANGUAGE EDUCATION COURSES |  |  |

## Language Use Courses

Ling 514 Linguistic Pragmatics 4
Ling 515 Linguistic Phonetics 4
Ling 516 Discourse Analysis 4
Ling 532 Sociolinguistics 4
Ling 537 First Language Acquisition 4
Ling 576 Corpus Linguistics 4
Ling $580 \quad$ Bilingualism 4
Ling 581 World Englishes 4
Ling 582 Pidgins and Creoles 4
Ling 510 can be used only with adviser approval.

| Language Education Courses |  |  |
| :--- | :--- | :--- |
| Ling 509 | LanguageTeaching Practicum | 4 |
| Ling 539 | Language Assessment | 4 |
| Ling 570 | Grammar for TESOL | 4 |
| Ling 572 | Teaching Pronunciation | 4 |
| Ling 573 | Computer Assisted Language | 4 |
|  | Learning |  |
| Ling 575 | Curriculum Design andMaterials <br>  <br>  <br> Developmentin TESOL | 4 |

Ling 510 can be used only with adviser approval.

The thesis will conformto departmental and university guidelines for details such as thesis proposal meetings, defenses, and formatting.
All courses need to be passed with a grade of "B" or better in order forthem to count toward this degree. Ling 507
(Seminar) and Ling 510 (Selected Topics) will count for credit in a particularcurriculumcomponent area, depending on course content, with prior approvalby the student's adviser.

Additionally, the department and the university require at least two years'study of a language in addition to the student's native language or an equivalent level of proficiency in a non-native language. Fornon-native speakers of English, proficiency in English as described above fulfills this requirement. For native speakers of English, two years of college-level study of an additional language as documented by a transcript fulfills this requirement. Students who have not already hadtwo years or the equivalent of an additional language at the college level can complete the graduation requirement while working on the M.A., but doing so will likely lengthen the time for completing the degree.

## Biology

246 Science Research and Teaching Center (SRTC) 503-725-8757
www.pdx.edu/biology

- B.A., B.S.
- Minor
- Secondary Education Program
- M.A.,M.S.
- M.A.T. and M.S.T. (Science/Biology)
- Ph.D.-Biology


## Academic Affiliations and Cooperative Programs

The Center forLife in Extreme Environments (CLEE) is housed at Portland State University and includes faculty members and students who study organisms from some of the most extreme habitats on Earth. Cooperative programs at Portland State University include the Marine Mammal Stranding Network, OregonZoo, Malheur Field Station, Oregon Health Sciences University, Oregon National Primate Research Center, Oregon Museumof Science and Industry (OMSI), and the Oregon Department of Fish and Wildlife. The Oregon University Systemmaintains the Institute of Marine Biology near Coos Bay and The Hatfield Marine Sciences Center in Newport on the Oregon coast.

## Undergraduate programs

The biology programis designed to prepare students for careers in biological research, teaching, health sciences, biotechnology, conservation biology and wildlife management, forestry, and other applied fields. It also provides the necessary background for advanced study leading to graduate degrees in the more specialized fields of the biological sciences.
A student planning to enter medicine, dentistry, or other professional fields should consult the catalog of the profes sional school to which the student intends to apply following pre-professional work in biology and other sciences at Portland State. Biology is also a teaching endorsement area in the programof secondary education.

## DEGREE MAPS AND LEARNING OUTCOMES

To view the degree maps and expected learning outcomes for the Biology undergraduate degree, go to
www.pdx.edu/academic-programs/a-z.

## ADMISSION REQUIREMENTS

Admission to the department is based on general admis sion to the University. See Admis sions Requirements (p. 8) for more information.

## BIOLOGY B.A./B.S.

## REQUIREMENTS

In addition to satisfying general University requirements, a student majoring in biology must meet general department requirements as well as fulfill the biology major requirements.
General requirements are completion of two terms of statistics or two terms of calculus; three terms of science majors' introductory chemis try with laboratory; one term of organic chemistry; Ph 201 or Ph 231; Ph 214; and 12 elective credits fromanthropology, chemistry, computer science, environmental science, geology, mathematics, physics, psychology, public health education, or statistics at the 200 level or higher. Courses used to meet any other general departmental requirement cannotals obe used in the 12 elective credit area, and university studies courses are not accepted to ward fulfillment of this requirement.
All biology majors must complete a minimum of 60 credits in biology including three terms ofscience majors' introductory biology with laboratory. Of the 60 credits required for the major a minimum of 44 credits must be completed in upper-divisionbiology specific coursework.
Biology courses taken under the pass/no pass grading option are not accepted toward fulfillment of departmental
major requirements, with the exception of courses numbered $\mathrm{Bi} 401, \mathrm{Bi} 404, \mathrm{Bi} 405$, and Bi 406 which are offered with either the A-ForP/NP grading option, and Bi 407 Seminar which is only offered as P/NP. Of the 60 credits required in biology, a minimum of 46 credits must be in courses other than $\operatorname{Bi} 401, \operatorname{Bi} 404, \operatorname{Bi} 405, B i 406$, and Bi 407 . Students may apply a maximum of 6 cumulative credits fromthe following research and experiential learning elective options $\mathrm{Bi} 401, \mathrm{Bi} 404, \mathrm{Bi}$ $405, \mathrm{Bi} 406$ toward fulfillment of the biology major credit requirements.

Biology majors interested in the Biology Honors Research Programmay obtain information in the Biology Dept. Office.

## General Departmental Requirements

## All Biology majors must complete the General Departmental coursework listed below in addition to the Biology major requirements.

Ch 221
General Chemistry I
Ch 222 General Chemistry II 4
Ch 223 General Chemistry III 4
Ch 227 General Chemistry Laboratory 1
Ch 228 General Chemistry Laboratory 1
Ch 229 General Chemistry Laboratory 1
Ch 331 Elements of Organic Chemistry I 4
Ch $334 \quad$ Organic Chemistry I 4
Ph 201 General Physics 4
Ph 231 General Physics I with Life 4
Science and Medical Applications

Ph $214 \quad$ Lab for Ph 201 or Ph 211 or Ph 221 or Ph 231

Mth $251 \quad$ Calculus I
\&
Mth $252 \quad$ Calculus II
or
Stat 243 Introduction to Probability and Statistics I \&
Stat 244 Introduction to Probability and Statistics II

Additionalscience/social science electives: Any combination of courses at the $200+$ level that are not part of the University Studies Programfrom the following departments: ANTH, CH, CS,

ESM, G, MTH,PHE, PSY, PH, or STAT. Courses utilized to fill any other general departmental or biology major requirement cannotalso be counted in the elective sciences area.University Studies courses taken in any of the listed departments cannotbe applied to ward fulfillment of this area.

## Biology Major Requirements

Lower Division Biology Core
Enrollment requires concurrent enrollment in $\mathbf{C h} 221$ \& Ch 227 or prior completion of Ch 221 \& Ch 227

| Bi 211 | Principles of Biology: Biology of <br> Cells | 4 |
| :---: | :--- | :---: |
| Bi 212 | Principles of Biology: The <br> biology of organisms | 4 |
| Bi 213 | Principles of Biology: Evolution <br> and ecology of living organisms | 4 |
| Bi 214 | Principles of Biology Lab I | 1 |
| Bi 215 | Principles of Biology Lab II <br> Bi 216 | 1 |
| Principles of Biology Lab III | 1 |  |

Upper Division Biology Core
Complete a minimum of 44 upper di vision Biology credits and satisfy Requirements 1,2, and 3 below
Requirement 1
Complete a minimum of one course in Area A and one course in Area B. Complete both courses in Area C.

## Area A: Cellular/Molecular

Complete at least one course fromthe list below:

| Bi 334 | Molecular Biology | 4 |
| :--- | :--- | :--- |
| Bi 336 | Cell Biology | 5 |
| Bi 341 | Introductionto Genetics | 4 |

Area B: Systems/Organisms
Complete at least one course fromthe list below:

| Bi 320 | Introduction to Organismal <br> Physiology |
| :--- | :--- |
| Bi 330 | Introduction to Plant Biology |
| Bi 380 | Microbiology |
| Bi 386 | Invertebrate Zoology |
| Bi 387 | Vertebrate Zoology |

Bi 380 Microbiology 4
Bi 387 Vetebrat

## Area C: Ecology/Evolution

Both courses mustbe completed:
Bi 357 General Ecology
Bi 358 Evolution 4

## Requirement 2

Choose a minimum of two courses at the $\mathbf{3 0 0}$ or $\mathbf{4 0 0}$ level with a major laboratory or field component. Bi 386 or Bi 387 will satisfy Requirement 2 only if the course is not already being used to fulfill Area B.
Approved Lab--Field Courses. Choose at least two:
Bi 301 Human Anatomy and Physiology 4

Bi 302 Human Anatomy and Physiology 4
Bi 303 Human Anatomy and Physiology 4
Bi 326 Comparative Vertebrate 5
Embryology
Bi 328 Comparative Vertebrate 5
Anatomy
Bi 337 Cell Biology Laboratory 1
Bi 361 Introduction to Marine Biology 1
Laboratory
Bi 386 Invertebrate Zoology 6
Bi 387 Vertebrate Zoology 6
Bi 388 Microbiology Techniques 2
BI $410 \quad$ Selected Topics (with laboratory) 1-6
Bi 413 Herpetology 6
Bi 414 Ornithology 6
Bi 415 Mammalogy 6
Bi $416 \quad$ Marine Mammals 6
Bi 425 Natural History of Antarctica 5
Bi 431 Advanced Molecular andCell 2
Bi 432 Plant Diversity and Evolution 5
Bi 435 Plant Systematics 4
Bi 441 Plant Physiology 5
Bi $450 \quad$ Phylogenetic Biology 4
Bi 455 Histology 6
Bi $471 \quad 4$
Bi 472 Natural History 3
Bi 473 Field Sampling 4
Bi 476 PopulationEcology 5

## Requirement 3

Choose a minimum of $\mathbf{1 2}$ credits from courses with the Bi prefix numbered between 412-499 (can include courses listedin Requirement 2 that were not also used to fulfill Requirement 2 (Lab/Field Area)).
Additional upper division elective credit options to consider:

Experiential learning elective options in research, co-op education, internships, workshops, and projects are available and students are highly encouraged to pursue these opportunities. A maximum of 6 credits total fromBi 401 Research, Bi 404 Cooperative Education, Bi 405 Reading and Conference, Bi 406 Laboratory Project may be applied toward fulfillment of biology major credit requirements.
Subtotal: 60

## BIOLOGY MINOR

## REQUIREMENTS

To earn a minor in biology, a student must complete at least 27 -credits in Biology (at least 9 credits of which must be taken in residence at PSU). Courses must include three terms of sciencemajors' introductory biology with laboratory (BI $211 / 214$, BI $212 / 215$, BI $213 / 216$ ) and at least one course fromeach of Areas A, B, and C.

## Lower Division Biology Core

Enrollment requires concurrent enrollment in Ch 221
\& Ch 227 or prior completion of Ch 221 \& Ch 227
Bi 211 Principles of Biology:Biology of 4 Cells
Bi 212 Principles of Biology: The 4 biology of organisms
Bi 213 Principles of Biology: Evolution
and ecology of living organisms

Bi 214
Principles of Biology Lab I
Bi $215 \quad$ Principles of Biology Lab II 1
Bi $216 \quad$ Principles of Biology Lab III 1
Upper-division credits to include at least one course from each of the following three areas:
Area A: Cellular/Molecular
$\begin{array}{lll}\text { Bi } 334 & \text { Molecular Biology } & 4 \\ \text { Bi } 336 & \text { Cell Biology } & 5\end{array}$
Bi 341 Introductionto Genetics 4
Area B: Systems/Organisms
Bi 320 Introduction to Organismal 4
Bi 330 Introduction to Plant Biology 4
Bi $380 \quad 4$
Bi 386 Invertebrate Zoology 6
Bi 387 Vertebrate Zoology 6

| Area C: | Ecology/Evolution |  |
| :---: | :---: | :---: |
| Bi 357 | General Ecology | 4 |
| Bi 358 | Evolution | 4 |

Courses taken under the undifferentiated grading option (pass/no pass) cannot be used to fulfill biology minor requirements. $\mathrm{Bi} 401, \mathrm{Bi} 404$, $\mathrm{Bi} 405, \mathrm{Bi} 406$, and Bi 407 are not allowed for the minor. Additional courses may be required as prerequisites.
Subtotal: 27-30

## NEUROSCIENCE MINOR

## CORE (12 CREDITS):

Each track must complete the following core requirements:

## Area A: Neurophysiology (4 credits) <br> Cellular Neuroscience <br> 4

or

Psy $200 \quad$ Psychology as a NaturalScience 4 or
Psy 451
Introduction to
Neurophysiological Ps ychology
Area B: Sens ory/Motor Systems (4 credits)
Bi 463 Systems Neuroscience
or
Psy $347 \quad$ Perception 4
or
SpHr 461 Neurology of Speech and Hearing

Area C: Res earch/Outreach (4 credits)
An approved 401 Research or 403 Thesis course

## ELECTIVES (16 CREDITS)

Each track must complete 16 credits of electives selected from the following list of approved courses:

| Track 1: Biology Majors (16 credits) |  |  |
| :---: | :---: | :---: |
| CS 441 | Artificial Intelligence | 4 |
| CS 445 | Machine Learning | 4 |
| Ling 233 | Language and Mind | 4 |
| Ling 433 | Psycholinguistics | 4 |
| Ling 445 | Linguistics and Cognitive | 4 |
|  | Science |  |
| PHE 466 | Mind/Body Health: Disease | 4 |
|  | Prevention |  |
| PHE 467 | Mind/Body Health: Human | 4 |
|  | Potential |  |
| PHE 473 | Physiology of Exercise | 4 |
| Phl 432 | Philosophy of Mind | 4 |
| Phl 471 | Topics in Philos ophy of Science: | 4 |
|  | Cognitive Science |  |
| Phl 471 | Topics in Philosophy of Science: Psychiatry | 4 |
| Psy 346 | Learning | 4 |
| Psy 348 | Cognition | 4 |
| Psy 399 | Neuros cience and Behavior | 4 |
| Psy 410 | Cognitive Neuroscience | 4 |
| Psy 410 | Neuroscience Outreach: The | 4 |
|  | Brain in Real Life |  |
| Psy 434 | Introduction to Ps ychopathology | 4 |
| Psy 450 | Psychopharmacology | 4 |
| Psy 452 | Advanced Neurophysiological Psychology | 4 |
| Psy 471 | Health Psychology | 4 |
| SpHr 471 | Neurolinguistics | 4 |
| SpHr 495 | Neurogenic Communication | 4 |
|  | Dis orders |  |
| Track 2: Psychology Majors (16 credits) |  |  |
| Bi 207 | Biology for Allied Health I | 4 |
|  | or |  |
| Bi 211 | Principles of Biology: Biology of Cells | 4 |


| Bi 214 | And |  |
| :---: | :---: | :---: |
|  | Principles of Biology Lab I | 1 |
| Bi 208 | Biology for Allied Health: | 4 |
|  | Evolution and Diversity of Life |  |
|  | or |  |
| Bi 212 | Principles of Biology: The | 4 |
|  | biology of organis ms |  |
|  | And |  |
| Bi 215 | Principles of Biology Lab II | 1 |
| Bi 209 | Biology for Allied Health: | 4 |
|  | Anatomy and Physiology |  |
|  | Systems |  |
|  | or |  |
| Bi 213 | Principles of Biology:Evolution | 4 |
|  | and ecology of living organisms |  |
|  | And |  |
| Bi 216 | Principles of Biology Lab III | 1 |
| Bi 301 | Human Anatomy and Physiology | 4 |
| Bi 302 | Human Anatomy and Physiology | 4 |
| Bi 303 | Human Anatomy and Physiology | 4 |
| Bi 320 | Introductionto Organismal | 4 |
|  | Physiology |  |
| Bi 412 | Animal Behavior | 4 |
| Bi 456 | Developmental Biology | 4 |
| CS 441 | Artificial Intelligence | 4 |
| CS 445 | Machine Learning | 4 |
| Ling 233 | Language and Mind | 4 |
| Ling 433 | Psycholinguistics | 4 |
| Ling 445 | Linguistics and Cognitive | 4 |
|  | Science |  |
| PHE 466 | Mind/Body Health: Disease | 4 |
|  | Prevention |  |
| PHE 467 | Mind/Body Health: Human | 4 |
|  | Potential |  |
| PHE 473 | Physiology of Exercise | 4 |
| Phl 432 | Philosophy of Mind | 4 |
| Phl 471 | Topics in Philosophy of Science: | 4 |
|  | Cognitive Science |  |
| Phl 471 | Topics in Philosophy of Science: | 4 |
|  | Psychiatry |  |
| SpHr 471 | Neurolinguistics | 4 |
| SpHr 495 | Neurogenic Communication | 4 |
|  | Disorders |  |
| Track 3: All Other Majors (16 credits) |  |  |
| Bi 207 | Biology for Allied Health I | 4 |
|  | or |  |
| Bi 211 | Principles of Biology: Biology of Cells | 4 |
|  | And |  |
| Bi 214 | Principles of Biology Lab I | 1 |

Bi 208

Bi 212

Bi 215

Bi 209

Bi 213

Bi 216
Bi 301
Bi 302
Bi 303
Bi 320

Bi 412
Bi 456
CS 441
CS 445
Ling 233
Ling 433
Ling 445
PHE 466
PHE 467
PHE 473
Phl 432
Phl 471
Phl 471
Psy 346
Psy 348
Psy 399
Psy 410
Psy 410
Psy 434
Psy 450
Psy 452
SpHr 471
SpHr 495
SW 441

Biology for Allied Health:
Evolution and Diversity of Life or
Principles of Biology: The biology of organisms And
Principles of Biology Lab II
Biology for Allied Health:
Anatomy and Physiology Systems
or
Principles of Biology: Evolution
and ecology of living org anisms And
Principles of Biology Lab III
Human Anatomy and Physiology
Human Anatomy and Physiology
Human Anatomy and Physiology
Introduction to Organismal
Physiology
Animal Behavior
DevelopmentalBiology
Artificial Intelligence
Machine Learning
Language and Mind
Psycholinguistics
Linguistics and Cognitive
Science
Mind/Body Health: Disease
Prevention
Mind/Body Health: Human
Potential
Physiology of Exercise 4
Philosophy of Mind 4
Topics in Philosophy of Science:
Cognitive Science
Topics in Philos ophy of Science:
Psychiatry
Learning
Cognition
Neuroscience and Behavior $\quad 4$
Cognitive
Neuroscience Outreach: The
Brain in Real Life
Introduction to Psychopathology
Psychopharmacology 4
Advanced Neurophysiological 4
Psychology
Neurolinguistics
Neurogenic Communication 4
Dis orders
Psychobiology for Social
Workers

## Total CreditHours: 28

## SECONDARY EDUCATION

## Adviser: Dr. Sarah Eppley

Students who wish to teach biology in secondary schools should complete one of the two programs shown, but may also want to consider pursuing a Master's of Education dependent upon overall career goals as it includes additional preparatory coursework generally required for most secondary school teaching positions. Courses for the Biology MAT/MST are to be taken for differentiated grades, except for those offered for pass/no pass only. Students must have at least a 3.00GPA in the recommended science courses and must earn at least a $C$ in each course of the endorsement area. Students should also take Psy 311. If you are interested in pursuing teaching in secondary schools please als oreview the Master's of Education with science endorsement programas it may be a better fit for yourcareer as pirations and is more widely accepted for employment in secondary education in Oreg on. For more information on the Master in Education (M.Ed.) programfor secondary educators please see:
https://www.pdx.edu/ci/gtep

## REQUIREMENTS

## Biology majors

Students must complete a biology major's programas outlined above, and include an upper-division course each in microbiology, ecology, genetics, cellbiology, and evolution. (See adviser.)

## Non Biology majors

| One year-long sequence in | $12-$ |
| :--- | ---: |
| introductory biology | 15 |
| Elementary Microbiology | 4 |
| Microbiology Laboratory | 2 |
| Two upper-division courses in | 8 |
| anatomy and/or physiology |  |
| Introductionto Genetics | 4 |
| General Ecology | 4 |
| Evolution | 4 |
| Upper-division biology elective | 4 |
| in botany or field oriented course <br> 4 |  |
| Physical scienceelectives as <br> approved by adviser | 18 |

Subtotal: 64-67

## Graduate programs

The Department of Biology offers graduate degrees leading to the Master of Arts or Master of Science, and the

Master of Arts in Teaching orMaster in Teaching Science/ Biology. The departmentalso offers an advanced Ph.D. degree in biology. The latter specialized degree is attained through the successful completion of requirements as stipulated by the department and the student's research committee (see below).

## ADMISSION REQUIREMENTS

In addition to the instructions for admission to the graduate program (p.42), the department requires the following information from each applicant to the M.A., M.S., M.S.T., or Ph.D. programin biology:

1. Satis factory scores on the general Graduate Record Examination (GRE).
2. Two letters of evaluation frompersons qualified to assess the applicant's promise as a graduate student.
3. The student should submit an application using the online form found on the the Graduate School's website.

The prospective student should realize that a high GPA and acceptable GRE scores do not guarantee admission to the graduate programs in biology because of variables including the availability of appropriate advisers, research space, and departmental resources.

## BIOLOGY M.A./M.S.

See University master's degree requirements (p. 52). Specific departmental requirements are listed below.

Satis factory completion of at least 45 credits of approved graduate-level courses required for a master's degree. Students must complete Bi 598 Graduate Research Prospectus, and Bi 599 Graduate Grant Writing in the fall and winter quarters following admission to the program. The student must complete at least 30 credits in the field of biology. No more than 9 credits may be in Bi 503 Thesis. No more than a total of 12 credits may be in Bi 501 and Bi 505 Reading and Conference. No more than a total of 9 credits may be in Bi 507 Seminar. A maximum of 12 credits may be programmed as electives in fields related to biology in consultation with the degree adviser. Successful completion of a final oral examination and a thes is is required. Full time students must complete their degree within 4 years of entry into the program.

BIOLOGY M.A.T./M.S.T.
The College of Liberal Arts and Sciences offers the M.A.T./ M.S.T. degrees in Science/Biology. In consultation with the graduate adviser, the student should establish the degree programbefore the completion of 15 credits of coursework. The programmust include a minimum of 45 credits in approved graduate courses, to
include a minimum of 24 credits in the area of concentration. Students must complete Bi 598 Graduate Research Prospectus, and Bi 599 Graduate Grant Writing in the fall and winter quarters following admis sion to the program. At least 9 credits, but no more than 15 credits, must be in education courses and must include Ed 520 Introduction to Education and Society. The 45 credits required must include 6 credits in either Bi 501 Project Track: Research Project relating to biology teaching (i.e. curriculummodule, grant proposal, community development project) as approved by student's committee; or Bi 504 PracticumTrack: 6 credits in practicum/internship/community outreache experience as approved by student's committee. In order to fulfill requirements for the degree, the student must satisfactorily complete the degree programand pass both a final written examination and a final oralexamination.

## BIOLOGY CONTINUING TEACHING LICENSE

The requirements for the continuing teaching license include satisfactory completion of 45 credits of upperdivision and graduate work earned subsequent to receipt of a bachelor's degree. The 45 credits are in addition to those required for the initial teaching license. For the continuing endorsement in biology, the student must take at least 15 credits of adviser-approved graduate-level work distributed to strengthen the student's background in science. Although no specific courses in science are required for the continuing endorsement, combined undergraduate and graduate preparation must include at least 36 credits in biology and must include specific courses. Each student's programis tailored to meet the needs of the individual and the requirements of the continuing endorsement and the continuing license. See Licensure (p.150) for the required education courses.

## BIOLOGY PH.D.

ProspectivePh.D. students are required to take Bi 698 Graduate Research Prospectus, Bi 699 Graduate Grant Writing, and Bi520 Ethical Practice in the Life Sciences in the fall, winter, and spring quarters following admission to the program. Students must also complete 6 credits of Bi 607 Seminar, 27 credits of Bi 603 Dissertation, and 39 credits of coursework at the 500/600 level and above.
The student mustalso have taken a departmental comprehensive examby the fifth quarter after entering the program, followed the next quarter by a formal defense of their Ph .D. prospectus. Successful completion of the degree is contingent on the completion of original research, and presentation of results in a public oraldefenseand production of a formal dis sertation that is submitted to and approved by the student's research committee and the Graduate School. Students must complete their degree within seven years of entry into the program.

## Black Studies

150 Parkmill (PKM)
503-725-3472
www.pdx.edu/blackstudies

- B.A., B.S. in Black Studies
- Minor in Black Studies
- Post Baccalaureate Certificate in Black Studies

The Department of Black Studies is an academic interdisciplinary unit within the College of Liberal Arts and Sciences. It is one of four units in the School of Gender, Race, and Nations. The Department of Black Studies is devoted to theexploration and analysis of all aspects of African people and people of African descent in the United States, the Caribbean/Latin America, and Europe. It seeks to research and teach about the Black experience through the interdisciplinary contributions of its faculty by providing comprehensive learning programs aimed at greater understanding of the historical and contemporary experiences of people in Africa and African descended people across the Americas, the Caribbean and Europe.

The Department of Black Studies provides students who opt for the Black Studies major, minor, certificate, or as an addition to majors such as anthropology, English, sociology, community studies, history, etc., a variety of course offerings. These courses serve to expand students’ breadth of knowledge in related courses offered by the department or as a complement to those in other departments. Students gain an understanding of the complex relationships across and between race/racism, gender/sexism, sexuality/homophobia, class differences and inequalities. The Department of Black Studies attempts to incorporate in its understandings and analysis of Black Life cultural themes such as music, literature, and film; institutions like the family, religion, housing, employment, criminal injustice systemand health care; and the more general realms of culture and political economy into its curriculumand its courses.

The programprovides students with a general his torical background of the Black experience in Africa and the Western hemisphere, as well as locally. Students also examine contemporary inter- and intra-racial/ethnic dynamics and are encouraged to engage in study and/or civic engagement courses to support their interests in global and community studies. The Department of Black Studies prepares students to work with African, Black or African American communities and to apply for graduate studies in a variety of disciplinary and professional programs. It will also give students a crucial competitive advantage in obtaining careers in those areas and within communities that interact with African, African American, and Caribbean/Latin American cultures.

Students interested in any of the degree programs offered in the Department of Black Studies are strongly encouraged to enroll in BST 202: Introduction to Black Studies or any other 200-level course. Students should meet with the undergraduate advisor for assistance with course selection based on their interests. For students who plan to apply to graduateschool, it is important that they meet with one of their professors, the undergraduate advis or, or the department chair during their junior year, in order to discuss options for courses to enhance their research skills, such as the practicum, reading and conference, or other experiential learning courses.

## DEGREE MAPS AND LEARNING OUTCOMES

To view the degree maps and expected learning outcomes for the Black Studies Department's undergraduate degrees, go to www.pdx.edu/academic-programs/a-z.

## ADMISSION REQUIREMENTS

Admis sion to the department is based on general admis sion to the University. See Admis sions Requirements (p. 8) for more information.

## BLACK STUDIES B.A./B.S.

## REQUIREMENTS

In addition to meeting the general University degree requirements for completing a B.A. or B.S., candidates enrolled in the Black Studies major must meet the 60credit minimum. Courses taken under the undifferentiated grading option (pass/no pass) are not acceptable toward fulfilling the major requirements in the area of specialization. At least 30 of the total 60 credits required for the major or 45 of the total credits presented for graduation must be taken in residence at Portland State University. A minimum 2.50 GPA is required in courses taken for the major. Students interested in declaring a major in Black Studies should see the department undergraduate advisor or the department chair for as sistance with Black Studies course selection.

## Core courses

BSt 202
BSt 396

BSt 407
Introduction to Black Studies
Research Methodologies in Black Studies
Seminar
And Either
BSt 411 African American History Seminar
or

Topics in African/Caribbean History And Culture

Eective Courses
BSt Two lower-division Black Studies courses
BSt Six upper-division electives in Black Studies
Three upper-division non-Black
Studies courses or advisor-
approved courses
Subtotal: 60

## BLACK STUDIES MINOR

## REQUIREMENTS

To earn a minor in Black Studies, a student must complete 28 credits ( 12 credits of which must be taken in residence at Portland State University). These courses must include eight credits in lower division (those listed below or other Black Studies lower-division courses approved by the department chair), 12 credits in upperdivision, and eight upper-division ad visor-approved credits chosen from departments in the College of Liberal Arts and Sciences. Students interested in declaring a minor in Black Studies should see the department undergraduate advisor or the department chair for assistance with Black Studies course selection.

| Two courses chosen from: (8) |  |  |
| :---: | :---: | :---: |
| BSt 202 | Introduction to Black Studies | 4 |
| BSt 203 | African American History I- | 4 |
|  | Slavery to the Harlem |  |
|  | Renaiss ance |  |
| BSt 204 | African American History II - | 4 |
|  | From the Depres sionEra to Civil |  |
|  | Rights |  |
| BSt 206 | Caribbean Studies | 4 |
| BSt 211 | Introduction to African Studies | 4 |

Five upper-division courses in Black Studies or courses with Black Studies related content (20)
Subtotal: 28

## BLACK STUDIES POSTBACCALAUREATE CERTIFICATE

## REQUIREMENTS

Conferral of a B.A. or B.S. degree is a prerequisite for a certificate in Black Studies. Candidates for the Black Studies certificate mustcomplete 36 credits with 24 of these credits in courses in Black Studies. Twenty-four credits will be upper-division courses within an area of specialization constructed with the consent of the adviser. Students interested in declaring a postbaccaluareate
certificate in Black Studies should see the department undergraduate advisor or the department chair for as sistance with Black Studies course selection.
Courses taken under the undifferentiated grading option (pass/no pass) are not acceptable toward fulfilling certificate requirements.

## CENTER FOR BLACK STUDIES

150 Parkmill (PKM)
503-725-3472
Established in 1969, the Center for Black Studies at Portland State University facilitates the study of the past and presentexperiences of black America. Among the goals of the center is to act as a forumbetween faculty members and students of different disciplines who share an interest in Black Studies; to collect and disseminate information which accurately reflects and helps improve the black experience; and to link the University and Black communities by maintaining an active role in community service.
The Center provides the University and the broader community with culturalactivities and the stimulation of an exciting and en lightening intellectual atmosphere in the Portland community, contributing to greater understanding and cooperation between people of various racial and ethnic backgrounds. The Black Bag Speaker Series brings to the campus and the Portland community speakers of different disciplines and philosophies who have made notable contributions to society. The center promotes national and international activities in this area through the generation of grants, proposals, and programs that combine University staff, money, and expertise with resources from the government and the private sector.

## Chemistry

262 Science Research \& Teaching Center (SRTC) 503-725-8756 www.pdx.edu/chemistry
chemistry @pdx.edu

- B.A., B.S.
- Minor
- Secondary Education Program
- M.A.,M.S., M.A.T. and M.S.T. (Science/Chemistry)
- Ph.D.-Chemistry


## Undergraduate programs

Chemistry is the study of the reactions of atoms and molecules, the stuff from which people and their physical environment are made. With a relatively s mall knowledge of atoms and molecules, it is possible to have a
considerable understanding of many chemical phenomena we see and use. A comprehensive knowledge of chemis try is essential for the person who wis hes to help solve the problems of today - problems of illness and disease, problems of wise use of ourresources - and for the person who wants to do basic research in chemis try or who wants to work in the chemical industry.

The Department of Chemistry is committed to maintaining a teaching programofexcellence at the undergraduate level as well as having a graduate programemphasizing cutting-edge research in the chemis try of the environment, novel materials and biological systems. Courses tailored for the student desiring only an introduction to the field are offered on a regular basis. A wide variety of other courses in the programare designed to offer fundamental training for students majoring in chemistry or for students in other science areas, such as biology or health-related occupations.
The curriculum, faculty, library, and facilities of the department are approved by the American Chemical Society. Graduating chemis try majors are eligible for certification to become members of the ACS after two years of professional experience.

## DEGREE MAPS AND LEARNING OUTCOMES

To view the degree maps and expected learning outcomes for Chemistry's undergraduate degrees, go to www.pdx.edu/academic-programs/a-z.

## ADMISSION REQUIREMENTS

Admission to the department is based on general admission to the University. See Admissions Requirements (p.8) for more information.

CHEMISTRY B.A./B.S.

## REQUIREMENTS

A student majoring in chemis try is required to take a minimum of 70 credits in the subject and will take courses in the core areas of general chemistry, analytical chemistry, organic chemis try, physical chemistry, inorganic chemis try, and biochemistry. For transferstudents, a minimum of 20 credits in upper-division chemistry courses must be earned at PSU.
In addition to meeting the general University de gree requirements, the major in chemis try must meet the following departmental requirements:

## Option I: Chemistry

Ch 221 General Chemistry I 4
Ch 222 General Chemistry II 4
Ch 223 General Chemistry III 4
Ch 227 General Chemistry Laboratory 1

| Ch 228 | General Chemis try Laboratory | 1 |
| :---: | :---: | :---: |
| Ch 229 | General Chemistry Laboratory | 1 |
| Ch 320 | Quantitative Analysis | 4 |
| Ch 321 | Quantitative Analysis Laboratory | 2 |
| Ch 334 | Organic Chemistry I | 4 |
| Ch 335 | Organic Chemistry II | 4 |
| Ch 336 | Organic Chemistry III | 4 |
| Ch 337 | Org anic Chemistry Laboratory I | 2 |
| Ch 339 | Org anic Chemistry Laboratory II (chemmajors) | 3 |
| Ch 426 | Instrumental Analysis | 4 |
| Ch 427 | Instrumental Analy sis | 4 |
|  | Laboratory |  |
| Ch 411 | Advanced Inorganic Chemistry I | 4 |
| Ch 440 | Physical Chemistry I | 4 |
| Ch 441 | Physical Chemistry II | 4 |
| Ch 442 | PhysicalChemistry III | 4 |
| Ch 443 | Numerical Data Analysis and Modeling in Chemistry | 2 |
| Ch 444 | Physical Chemistry Laboratory | 2 |
| Ch 4XX | Two approved 400-level chemistry courses | 6-8 |
|  | One yearof physics with calculus with laboratory | 15 |
|  | Calculus through Mth 253 or equivalent | 12 |
| Option II: Biochemistry |  |  |
| Ch 221 | General Chemistry I | 4 |
| Ch 222 | General Chemistry II | 4 |
| Ch 223 | General Chemistry III | 4 |
| Ch 227 | General Chemistry Laboratory | 1 |
| Ch 228 | General Chemistry Laboratory | 1 |
| Ch 229 | General Chemistry Laboratory | 1 |
| Ch 320 | Quantitative Analysis | 4 |
| Ch 321 | Quantitative Analysis Laboratory | 2 |
| Ch 334 | Organic Chemistry I | 4 |
| Ch 335 | Organic Chemistry II | 4 |
| Ch 336 | Organic Chemistry III | 4 |
| Ch 337 | Organic Chemistry Laboratory I | 2 |
| Ch 339 | Organic Chemistry Laboratory II (chemmajors) | 3 |
| Ch 440 | Physical Chemistry I | 4 |
| Ch 441 | PhysicalChemistry II | 4 |
| Ch 426 | Instrumental Analysis | 4 |
| Ch 427 | Instrumental Analysis | 4 |
|  | Laboratory |  |
| Ch 490 | Biochemistry: Structure and | 4 |
|  | Function |  |
| Ch 491 | Biochemistry:Enzy mology and Metabolism | 4 |
| Ch 492 | Biochemistry:Nucleic Acids and | 4 |
|  | Biological Information Flow |  |
| Ch 493 | Biochemistry Laboratory | 3 |
|  | Two approved 400-level science electives 6-8 | 6-8 |


|  | Calculus through Mth 253 or <br> equivalent <br> One year of physics with <br> calculus with laboratory | 12 |
| :--- | :--- | ---: |
| Bi 211 | Principles of Biology: Biology of <br> Cells | 15 |
| Bi 212 | Principles of Biology: The <br> biology of organis ms | 4 |
| Bi 213 | Principles of Biology: Evolution <br> and ecology of living organisms | 4 |
| Bi 214 | Principles of Biology Lab I | 1 |
| Bi 215 | Principles of Biology Lab II <br> Bi 216 | Principles of Biology Lab III |

Ch 490 requires the Ch 334, Ch 335, Ch 336 Organic Chemistry sequence as a prerequisite.

All courses used to satisfy the departmental major requirements, whether taken in the department or elsewhere, including courses from supporting departments (e.g., mathematics, physics, and biology), must be graded C- or above, with a combined GPA of 2.25 or higher, except for those major course requirements offered only on a pass/nopass basis. If an unsatisfactory grade is received in an upper-division course offered in the Department of Chemistry, a student will be allowed to retake the course to improve their grade only once.
A student will be certified by the American Chemical Society, and is eligible to become a member of the society after graduation, if the student is following Option I, and if the student als ocompletes Ch 411, Ch 490 (or Ch 350), and a lab course that includes at least 30 clock hours (including Ch 401 and Ch 406 ). Note that CH 490 qualifies as an Approved 400-level Chemistry elective.

The Department of Chemistry has an approved thesisbased Honors Degree program. Interested students should consult the Chemistry website and meet with the departmental Honors adviser for details.

## CHEMISTRY MINOR

## REQUIREMENTS

To earn a minor in chemistry a student must complete the courses outlined below; at least 10 credits of these must be taken in residence at PSU.

## Courses

Ch 221
General Chemistry I
Ch 222 General Chemistry II 4
Ch 223 General Chemistry III 4
Ch 227 General Chemistry Laboratory 1
Ch 228 General Chemistry Laboratory 1
Ch 229 General Chemistry Laboratory 1
Ch $320 \quad$ Quantitative Analysis 4
Ch $321 \quad$ Quantitative Analysis Laboratory 2
Ch $334 \quad$ Organic Chemistry I

| Ch 335 | Organic Chemistry II | 4 |
| :--- | :--- | :--- |
| Ch 336 | Organic Chemistry III | 4 |
| Ch 337 | Organic Chemistry Laboratory I | 2 |
| Ch 338 | Organic Chemistry Laboratory II <br> (nonmajors) | 2 |
| And one of the following: |  |  |
| Ch 440 | PhysicalChemistry I |  |
| Ch 350 | Biochemistry |  |
| Ch 490 | Biochemistry:Structure and | 4 |
|  | Function |  |

Courses should be taken for differentiated grades, except those offered only on a pass/no pass basis.
Subtotal: 37-42

## CHEMISTRY SECONDARY EDUCATION PROGRAM

Students who plan to obtain a teaching license with an endorsement to teach chemistry at thehigh school level should complete a baccalaureate degree with a major in chemistry (preferred) or in general studies/science. The degree programshould include the following courses:

## REQUIREMENTS

Courses
Ch 221
General Chemistry I
Ch 222
General Chemistry II
Ch 223
General Chemistry III
Ch 227 General Chemistry Laboratory
Ch 228 General Chemistry Laboratory
Ch 229 General Chemistry Laboratory
Ch 320 Quantitative Analysis
Ch 321 Quantitative Analysis Laboratory 2
Ch $334 \quad$ Organic Chemistry I 4
Ch 335 Organic Chemistry II
Ch 336 Organic Chemistry III
Ch 336 Organic Chemistry III 4
Ch $337 \quad$ Organic Chemistry Laboratory I 2
Ch 338 Organic Chemistry Laboratory II (nonmajors)
One of the following:

| Ch 440 | PhysicalChemistry I | 4 |
| :--- | :--- | :--- |
| Ch 350 | Biochemistry | 4 |
| Ch 490 | Biochemistry: Structure and | 4 |
|  | Function |  |


| Also required: |  | 4 |
| :---: | :--- | ---: |
| Ph 201 | General Physics | 4 |
| Ph 202 | General Physics | 4 |
| Ph 203 | General Physics |  |
|  | or | 4 |
| Ph 211 | General Physics (with Calculus) | 4 |
|  | I |  |
|  | General Physics (with Calculus) | 42 |


| Ph 213 | General Physics (with Calculus) |
| :---: | :---: |
|  | III |
|  | And |
| Ph 214 | Lab for Ph 201 or Ph 211 or Ph 221 or Ph 231 |
| Ph 215 | Lab for Ph 202 or Ph 212 or Ph 222 or Ph 232 |
| Ph 216 | Lab for Ph 203 or Ph 213 or Ph 223 or Ph 233 |

Subtotal: 56
Those majoring in general studies/science are advised to strengthen their preparation for teaching by taking additional chemistry and physics courses as their degree programs permit. Consult with the secondary education adviser for suitable courses. Chemistry teachers in many schools alsoteach physics, so it is recommended that additional physics courses be taken in preparation for eventually adding a physics endorsement to the license.

Courses should be taken for differentiated grades, except those offered only on a pass/no pass basis. A positive departmental recommendation for admis sion to the fifth-yearteacher-education program will depend on at least a C - in all chemistry and physics courses, as well as a combined 2.25 GPA forthese courses.

## Graduate programs

The Department of Chemistry offers graduate work leading to the following degrees: Master of Arts or Master of Science; Master of Arts in Teaching or Master of Science in Teaching (Science); Ph.D. in Chemistry.
The M.S. programis designed for the student who wishes to pursue a career as a professional chemist or a scientist in other allied disciplines. The programinvolves work in advanced courses with training in research techniques. An integral part of the programis the individual research project and thesis.
The M.A. programis designed for the student who wishes to obtain an advanced degree in chemistry, but for whom the time commitment of a traditional research degree (M.S.) is not feasible, this programinvolves advanced cours ework and a literature project.
The M.A.T./M.S.T. is offered to provide scientific training for teachers in secondary schools. The programis composed of courses intended to increase the sophistication of the student in chemical principles and to acquaint the student with current techniques in teaching methods.

The programleading to the Ph.D. in Chemis try combines original research with advanced cours ework in various disciplines of chemistry. Research foci in the department are biological chemistry, materials chemistry, and environmentalchemistry. Students that complete the
programare prepared to pursue careers in academic, industrial, or government research.

## ADMISSION REQUIREMENTS

Admission to the graduate programs is contingent upon general admission to the University. See the Graduate Programs page (https://www.pdx.edu/chemistry/graduateprograms) on the Department's website for admissions requirements, programinformation, and application instructions.

## CHEMISTRY M.A.

Designed for the student who wishes to obtain an adv anced degree in chemistry, but for whom the time commitment of a traditional research degree is not feasible, this program involves advanced coursework and a literature project.

The candidate must complete a minimum of 45 credits in approved graduate courses. Of these, 36 credits must be chosen from substantive classes at the graduate level, excluding Chem501, Chem 503, Chem 505, Chem 507 and Chem605.

For the M.A., if the student has not successfully completed two academic years of a foreign language at the undergraduate level, the student mustshow competence by examination.

## STUDENTS NEED TO COM PLETE (ON THEIR OWN TIMELINE):

- A total of 45 graduate-level credits (foreign languages classes cannot be applied to this requirement)
- 36 credits of substantive coursework (graduate level: 510+) - up to 8 credits of which may be "approved" graduate-levelclasses outside Chemistry (e.g. Physics, Biology, SystemScience)
- Department seminar (CH507) - offered each FWS term, enrollment required in all FWS terms in which the studentis in the program.
- Complete a $10+$ page written report - give to the Chair of the Graduate Affairs Committee (GAC) before the ninth week of the termin which you expect to graduate (will be graded by Chemistry faculty: expect at least one round of revisions)
- A foreign language requirement - can testout or take classes

An example of an enumeration of credits is as follows:

- 9500 -level classes at 4 credits each $=36$ credits
- CH507 seminar (Fridays): 1 credit each FWS term enrolled, for 6 terms
- CH501 research: 1 credit
- CH505: graded literature paper: 2 credits

CHEMISTRY M.S.
The MS in Chemistry consists of a combination of cours ework, research, and thesis (an experimental or theoretical research projectresulting in an original contribution to chemicalknowledge). Candidates must complete a minimum of 45 approved graduate credits.

24 credits of formal graduate instruction must be chosen from substantive classes at the graduate level(CH501-509 and CH 601-609 may not be applied to this requirement). Included in the required 24 credits of coursework, all students must complete a one termScientific Communication course.

Each candidate for the MS degree in chemistry must complete a research project culminating in the preparation and defense of a thesis. Further details of all requirements are outlined in the Department ofChemistry's Graduate StudentHandbook.

## STUDENTS NEED TO COM PLETE (ON THEIR OWN TIMELINE):

- A minimum of 45 graduate-level credits, including the following courses:
- 24 credits of substantive coursework (graduate level: 510/610+) - up to 8 credits of which may be "approved" graduate-level classes outside Chemis try (e.g.Physics, Biology, SystemScience)
- CH 510: Scientific Communication (1st year)included in the 24 credits of graduate coursework
- CH 501: Research (research credits are normally accrued in every termthat the student is in the program)
- 6-9 Credits of CH 503: Thes is


## CHEMISTRY M.A.T./M.S.T.

The College of Liberal Arts and Sciences offers the M.A.T/M.S.T. degrees in Science/Chemistry. In consultation with the graduate adviser, the student should establish the degree programbefore the completion of 15 credits of coursework. The programmust include a minimum of 45 credits in approved graduate courses, to include a minimum of 24 credits in the area of concentration. At least 9 credits, but no more than 15
credits, must be in education courses. In order to fulfill requirements for the degree, the student must satisfactorily complete the degree programand pass both a final written examination and a final oralexamination.

CHEMISTRY PH.D.
The PhD in Chemistry consists of a combination of coursework, research, and dissertation (an experimental or theoretical research project resulting in an original contribution to chemical knowledge). Candidates must complete a minimum of 81 approved graduate credits.

24 credits of formal graduate instruction must be chosen from substantive classes at the graduate level (CH 501-509 and CH 601-609 may not be applied to this requirement). Included in the required 24 credits of coursework, all students must complete a one termScientific Communication course.

Each candidate for the Ph.D. degree in chemistry must complete the comprehensive examination, a prospectus examination and an original programof research. In addition candidates will present a research seminar to the department in their fourth year in residence. The culminating experience of the PhD is the preparation and defense of a dis sertation. Further details of all requirements are outlined in the Department of Chemistry's Graduate Student Handbook.

## STUDENTS NEED TO COMPLETE (ON THEIR OWN TIMELINE):

- A minimum of 81 graduate-level credits, including the following courses:
- 24 credits of substantive coursework (graduate level: 510/610+) - up to 8 credits of which may be "approved" graduate-level clas ses outside Chemistry (e.g.Physics, Biology, SystemScience)
- CH 610: Scientific Communication (1st year) included in the 24 credits of graduate coursework
- CH 601: Research (research credits are normally accrued in every termthat the student is in the program)
- CH 507: Seminar Presentation (4th year)
- 27 credits of CH603: Dis sertation


## Chicano/Latino Studies

150 Parkmill (PKM)
503-725-8499
www.pdx.edu/chicano-latino-studies/

- Minor in Chicano/LatinoStudies
- Certificate in Chicano/Latino Studies

Chicano/LatinoStudies is devoted to theexploration and analys is of the his tories, politics, experiences, and cultures of Chicanx/Latinx populations in the United States. CHLA seeks to explore Chicanx/Latinx experiences through an interd isciplinary and multidisciplinary approach to center the lived experiences and the production of knowledge of Chicanx/Latinx communities. Faculty examine how race, ethnicity, language, sexuality, gender, and other social identities intersect in Chicanx/Latinx communities and within the larger U.S. landscape. At its core, CHLA employs a decolonial, anti-racist, anti-sexist, framework to challenge centuries of white supremacy, settler colonialism, and other systems of oppression that have impacted how Chicanx/Latinxcommunities live, work, create, and thrive.
Graduates with a minor or certificate in Chicano/Latino studies will have augmented their major field of study by broadening their scope of knowledge. They will have gained importantinsight into a very different culture within U.S. borders. This increased awareness and ins ight will lead to successful interaction on many levels of society. Graduates also will be better prepared toenter the workforce with its rapidly changing demographics.

## DEGREE MAPS AND LEARNING OUTCOMES

To view the degree maps and expected learning outcomes for Chicano/Latino Studies' undergraduate degrees, go to www.pdx.edu/academic-programs/a-z.

## ADMISSION REQUIREMENTS

Admission to the programis based on general admission to the University. See Admis sions Requirements (p. 8) for more information.

## CHICANO/LATINO STUDIES MINOR

## REQUIREMENTS

In addition to meeting the generalPSU requirements for a degree in any field, students pursuing a minor in Chicano/Latino studies must complete 28 credits to be distributed as follows:
Core courses ( $\mathbf{1 6}$ credits)
$\begin{array}{ll}\text { ChLa } 201 & \text { Introduction to Chicano/Latino } 4 \\ & \text { Studies }\end{array}$
ChLa 301U Chicano/LatinoCommunities 4
ChLa 302U Survey of Chicano/Latino 4
Literature
ChLa 303U Chicana/LatinaExperience

## Upper Division Electives ( 12 credits)

One 400-level course and two others from the following:
ChLa Mexican American/Chicano 4 325/Hst 325 History I, 1492-1900
ChLa Mexican American/Chicano 4
326U/Hst History II, 1900-Present
326U
ChLa 330U Latino Popular Culture 4
ChLa 331U Barrio Culture: Art and 4
Literature
ChLa 335 Chicano/Latin AmericanFilm 4
ChLa 340 Mayas, Aztecs, and Chicanos 4
ChLa 360 Bilingualism in U.S. Latinx 4 Communities
ChLa 375U Southwestern Borderlands 4
ChLa 380U Latinos in the Economy and 4
Politics
ChLa 390U Latinos in the Pacific Northwest 4
ChLa 399 SpecialStudies 1-8
ChLa 405 Reading and Conference 1-8
ChLa 407 Seminar 1-8
ChLa 408 Workshop 1-8
ChLa 410 Selected Topics 1-8
ChLa 411 Chicano/LatinoHistory Seminar 4
ChLa 414 Chicano/LatinoLiterature 4
ChLa 450U Latinos in Education 4
Subtotal: 28

## CHICANO/LATINO STUDIES CERTIFICATE

## REQUIREMENTS

A candidate for a certificate must satisfy all University requirements for a baccalaureate degree with an academic major in any field. A Chicano/Latino Studies Certificate may be pursued as a post-baccalaureate program. A student pursuing a certificate in Chicano/Latino Studies must complete 36 credits, dis tributed as follows:
Core courses: ( $\mathbf{1 6}$ credits)
ChLa 201 Introduction to Chicano/Latino
ChLa 301U Chicano/LatinoCommunities
ChLa 302U Survey of Chicano/Latino
4 Literature
ChLa 303U Chicana/LatinaExperience
Spanish Language Proficiency ( 8 credits)
Span 301 Third-yearSpanish
Span 302 Third-yearSpanish
Upper-di vision electives from the following: ( 12 credits)
One 400-level course and two others from the following:

| ChLa | Mexican American/Chicano | 4 |
| :--- | :--- | :--- |
| 325/Hst 325 | History I, 1492-1900 |  |

History I, 1492-1900

ChLa Mexican American/Chicano 4
326U/Hst History II, 1900-Present
326U
ChLa 330U Latino PopularCulture 4
ChLa 331U Barrio Culture: Art and 4
ChLa 335 Chicano/Latin AmericanFilm 4
ChLa 340 Mayas, Aztecs, and Chicanos 4
ChLa $360 \quad$ Bilingualism in U.S. Latinx 4
Communities
ChLa 375U Southwestern Borderlands 4
ChLa 380U Latinos in the Economy and 4
Politics
ChLa 390U Latinos in the Pacific Northwest 4
ChLa 399 Special Studies 8
ChLa 405 Reading and Conference 4
ChLa 407 Seminar 4
ChLa 408 Workshop 4
ChLa $410 \quad$ Selected Studies 8
ChLa 411 Chicano/LatinoHistory Seminar 4
ChLa 414 Chicano/LatinoLiterature 4
ChLa 450U Latinos in Education 4
Subtotal: 36
Communication
University Center Building (UCB)
520 SW Harris on St., Suite 440
503-725-5384
www.pdx.edu/communication/

- B.A., B.S.
- Minor
- Honors
- M.S.


## Undergraduate programs

The Department of Communication offers programs leading to degrees at both the undergraduate and graduate levels.

The courses offered in communication are based on the premise that an educated individual must be able to think critically and analytically, comprehend political, social, cultural, institutional, international, and mediated communication, listen effectively, and be sensitive and adaptive to communicativeencounters with persons of diverse abilities, backgrounds, and situations. The effective communicatorhas an understanding of the complexity and dynamic nature of thecommunication process, as well as a sense of responsibility for the substance and consequences of communicative interaction.

DEGREE MAPS AND LEARNING OUTCOMES

To view the degree maps and expected learning outcomes for Communication's undergraduate degrees, go to www.pdx.edu/academic-programs/a-z.

## ADMISSION REQUIREMENTS

Admis sion to the department is based on general admission to the University. See Admis sions Requirements (p.8)for more information.

## COMMUNICATION B.A./B.S.

All classes in the major or minor must be taken for a letter grade and only clas ses graded C - or better will be counted toward the major or minor. Courses taken under the undifferentiated grading system(pass/no pass) will not be counted.

## REQUIREMENTS

In addition to meeting the generalUniversity requirements, the student must complete a minimum of 56 credits in communication courses.

## Courses

$\begin{array}{ll}\text { Comm } 300 & \text { Principles of Communication } \\ \text { Comm } 311 & \text { Research Methods in }\end{array}$ Communication

Comm 316 Communication, Individuals, and Discourse or
Comm 326
Communication, Society, and Culture

Communication electives
Of the 44 credits of communication electives,

- At least 28 must be in upper-division (numbered 300 and above) communication studies courses, of which
- At least 16 must be in course numbered 400 and above, of which
- At least 12 must be in courses numbered 410 and above.
- No more than 4 credits may be counted toward the major from courses numbered Comm 401 through Comm 409, including Communication Internship.
Total CreditHours: 56


## COMMUNICATION MINOR

To earn a minor in communication, a student must complete 28 credits with a minimum of 16 credits at the upper-division level. Total for Comm 401 through Comm

409 may not exceed 8 credits. A minimum of 12 credits must be taken in residence at PSU.

## FILM STUDIES MINOR

Students may elect to pursue a minor in film studies, jointly offered by Communication, English, and Theater Arts and should consult the department for a complete list of courses that apply to the minor from offerings in Communication, English, and Theater Arts. A minimum of 20 advis or-approved credits in film studies is required. At least 16 of these credits must betaken at Portland State University fromany of the three participating departments, and 16 credits must be upperdivision.

Courses taken under the undifferentiated grading system (pass/no pass) will not be counted. A minimum grade of C is required forcourses to be counted toward the minor. Advis or-approved film courses taken in communication will also be credited toward the major.

## COMMUNICATIONS 4 + 1 ACCELERATED BACHELORS PLUS MASTERS PROGRAM

Students currently enrolled in the BA or BS in Communication programmay be admitted directly into the MS in Communication programand share up to 16 credits of graduate level credit with the $\mathrm{BA} / \mathrm{BS}$ and MS in Communication. Students can complete both degrees in 4 +1 years.
Students can apply for the Bachelors plus Masters in spring of their junior year to be eligible to take 500-level courses in their senior year. The Bachelors plus Masters program must begin in fall of their final year as an undergraduate with enrollment in Comm 521. For more information on applications or the Bachelors plus Masters program, email commgradinfo@pdx.edu.

## Graduate program

The Department of Communication offers graduate work leading to the Master of Science in Communication. We offer two tracks for master's students. The Research Track is designed forstudents who want to focus on communication research in their careers and for those interested in doctoral studies. The Professional Track is designed for students who prefer to focus on applying their studies to their careers in communication. We especially encourage mid-career professionals to apply for this track. Students decide at the time they apply which track is most suitable for them. Our faculty concentrate on research in the areas of media, politics, health, conversation, persuasion, propaganda, and language and socialinteraction.

## ADMISSION REQUIREMENTS

Application reviews begin February 1 and end on May 31 each year. Early applications are strongly encouraged to secure placement and assistantships.
Applicants must als o apply separately to Portland State University (see The Graduate School's website (p. 42) for information and deadlines).

For admission to graduatestudy, the student's background and preparation should reflect an ability to pursue graduate work in communication. Students with undergraduate backgrounds in communication or a related discipline are encouraged to apply. Should the student's preparation be deemed inadequate in certain areas, the student will be required to overcome those deficiencies through formal coursework and/or directed readings. Allsuch work is separate fromwork toward the master's degree.

## Application process

Prospective students interested in graduate work should first check the Department website for current application and programinformation. Applicants should submit: Letter of application and statement of purpose (these may be combined into one document); Writing sample; Three letters of recommendation; Official transcripts; Official GRE scores (GREs are required for Research Track students and students who receive as sistantships. Other students are encouraged-but not required--to provide GRE scores); Official TOEFL/IELTS scores (for international and English second-language students); and the PSU application and fee (send separately). Decisions about admis sion, fellowships and assistantships will be made on a first-come, first-serve basis. All applicants are notified in late April.
All students are admitted to the program conditionally. Faculty evaluate your progress after onethird of the coursework is completed. Students in good standing will have their conditional status removed.
Good standing is defined in graduatestudies as a B (and higher) Grade Point Average (GPA). Students who stop taking courses need the approval of the Department Chair or Director of Graduate Studies to take a leave of absence, even forone quarter (except Summer). Students are required to be enrolled for at least 1 credit each termuntil they have completed all work, including thesis, project or exams.

Students who receive an incomplete grade in a course must finish outstanding coursework and earn a grade by the end of the following term/quarter. Students who have 2 outstanding incomplete grades are required to complete their coursework in good standing and earn grades before enrolling in additional courses. Note that students who receive a stipend, fellowship or assistantship mustresolve incomplete grades immediately.

COMMUNICATION M.S.
All students must meet both University and Department requirements to successfully complete the graduate programin communication. Successful students earn a Master's of Science degree with a major in Communication.

All students must complete a total of 46 graduate credits, of which 40 are taken in coursework, plus an additional 6 credits toward the student's Thesis or Project (exam). Every student completes the three core courses ( 12 credits) in addition to elective courses ( 28 credits). All students complete 6 credits toward their culminating thesis or project. Research Track students complete a thes is. Profes sional Track students may complete either a thes is or the project (exam) with the approvalof the graduate faculty.
Communication graduate students are expected to develop an understanding and appreciation of the theoretical, conceptual and methodological breadth of the discipline and to develop expertise in the pursuit of particular interests in the study of communication.

## REQUIREMENTS

Each student's programmust be based on the following:

## Core theory courses:

Each student is required to take one core theory course:
Comm 511 Introduction to Communication 4 Theory

## Core methods courses:

Each student is required to take two core methods courses as follows:
Comm 521 Quantitative Methods in
Comm 531 Qualitative Methods in Communication Research

## Total requiredcore course credits:

Subtotal: 12

## Minimum elective course credits:

Subtotal: 28
Minimum Thesis or Project credits:

## Subtotal: 6

Students are encouraged to choose electives from within the Department, and courses taken outside the Department must be approved by the student's programadv isor in order to count toward the requirements of the degree.

Every student is encouraged to take one credit of Comm 507 (Communication Research Apprenticeship) per quarter (a maximum of 6 credits may be counted toward the requirements of the degree). Comm507 involves working
closely with a faculty member in order to gain hands-on experience in how to conduct communication research.

All students need at least 40 credits in graduate coursework, including the core requirements, electives and apprenticeship courses. In addition, all students need at least 6 credits of Thesis or Project, bringing the total number of credits to 46 .
Subtotal: 46

## PROGRAM OPTIONS

All students complete one of the following with close supervis ion of their advisor. We strongly encourage students to pursue the thesis option.

## a. Thesis

The thesis entails a systematic study of a significant problemand contributes to the body of knowled ge relevant to the study. A thesis is a research report completed in close consultation with the student's academic advisor and may be either quantitative or qualitative. Each student who elects the thesis option will complete a written thesis and pass a finaloral examination. Prior to beginning work on the thesis, students must demonstrate proficiency in relevant theories and res earch methods. Students must complete at least 6 thes is credits (Comm503).

## b. Project

Students who choose the Project Option work closely with their faculty advisor on planning a course of study grounded in relevant theories, concepts and practices. All students who choose this option must demons trate appropriate res earch and methodological competency by successfully completing 3 exams as the culminating project. Students must complete at least 6 project credits (Comm 506).

## Conflict Resolution

Smith MemorialStudent Union(SMSU)
Suite M310
503-725-9175
www.pdx.edu/conflict-resolution

- B.A., B.S. Minor.
- UndergraduateCertificate in Transformative Messaging
- M.A.,M.S.
- Graduate Certificate in Conflict Resolution (GCCRCR)
- Graduate Certificate in Applied Conflict Res olution (GCCR-GCAP)
The Bachelors of Arts/Sciences, the Minor and Master of Arts/Sciences degree programs in conflict resolution are trans-disciplinary, encompassing the practicaland
theoretical bases of mediation and negotiation, involving research, theory, and competency-based education to help build conditions necessary for positive peace, conflict transformation (fromdes tructive to constructive), and univers al res pect for context-sensitive human rights.
Students in the conflict resolution programs learn how to analyze conflict, uncover the underpinnings of conflicts in a wide variety of settings and scales. Students gain skills to defuse and deescalatedestructive conflicts that arise among individuals, groups, and countries. Bachelor's degree holders are suited to entry-level careers in the field of conflict resolution, as well as being prepared to add value in any community setting, occupational field or workplace by bringing conflict tran sformation strategies to bear. Master's degree holders are prepared for leadership positions in conflict management and intervention via governmental, non-governmental, and corporate actors in local, regional, national and international settings. Minor degree holders add a conflict resolution component to their credentials while majoring in any field of study.
Both the graduate and undergraduate programs provides skill development through an integration of theory, method, and practice. Undergraduates acquire these skills commensurate with those required for working in peace and conflict settings, as well as those that add value to any community and occupational category. They go on to focus on transformation of conflict for the achievement of peace and social justice at the small group and community level. Graduate students emphasize implications of skill development for leadership in conflict and peace intervention, and goon to focus on perspectives, strategies and processes at the organizational level of peace building and conflict transformation.
Courses in conflict res olution are also offered in support of programs in other fields.


## Undergraduate programs

## DEGREE MAPS AND LEARNING OUTCOMES

To view the degree maps and expected learning outcomes for Conflict Resolution's undergraduate degrees, go to www.pdx.edu/academic-programs/a-z.

## ADMISSION REQUIREMENTS

Admission to the department is based on general admis sion to the University. See Admissions Requirements (p. 8) for more information.

## CONFLICT RESOLUTION B.A./B.S.

The Conflict Resolution BA/BS major is a 56-credit combination of 24 credits of required classes and 32 credits of CR electives. Eight (8) credits must be taken at the 400-
level. The learning outcomes prepare the CR major degree holderequally for graduate school and employmentin a CR-related field.

## REQUIREMENTS

## Required courses

All required classes mustbe graded A-F and students must earn a minimum of a C grade for it to apply toward a CR degree.

| CR 301U | Introduction to Conflict | 4 |
| :--- | :--- | ---: |
|  | Resolution |  |
| CR 307 | Conflict Management Skills | 4 |
| CR 310U | Conflict Resolution Values \& | 4 |
| CR 311U | Ethics |  |
| CR 312 | Intercultural Conflict Resolution | 4 |
| CR 411 | Conflict Resolution Career | 4 |
|  | Preparation | 4 |

Subtotal: 24

## Hectives

| CR 302U | Peace Studies | 4 |
| :--- | :--- | :--- |
| CR 303U | Consensus Building | 4 |
| CR 304U | Participating in Democracy | 4 |
| CR 305U | Ecology of War and Peace | 4 |
| CR 306U | Nonviolence: His tory and <br>  <br> Campaign Design | 4 |
| CR 314 | Introductionto Restorative | 4 |
|  | Justice |  |
| CR 416 | Evil and Hate | 4 |
| CR 419 | Forgiveness and Atonement | 4 |
| CR 420 | Individualand Group <br> Reconciliation Processes | 4 |
| CR 423 | Dialogue Across Differences <br> CR 428 | Human Values in Warand |
|  | Peace: Value Dilemmas, <br> Contradictions and Resolutions | 4 |
| CR 429 | European Union as a <br> Peacebuilding System | 4 |
| CR 439 | Family Mediation <br> CR 440 <br> CR 441 | Peer Mediation |
| CR 442 | Resolution <br> Peace Education | 2 |
| CR 443 | Nationalismversus Democracy <br> since 9/11 | 4 |
| CR 444 | Neighbors and Enemies: Cyprus, <br> Greece and Turkey | 4 |

Subtotal: 32
Electives also include CR 407 Seminar and CR 410
Selected Studies, as offered.
Subtotal: 56

Total Credit Hours: 56

## CONFLICT RESOLUTION MINOR

The Conflict Resolution minor is a 28 -credit combination of competency and academic coursework, preparing the student for graduate work or employment in CR-related degree programs or careers. The degree requirements of the minorare below.

## REQUIREMENTS

| Core courses |  |  |
| :--- | :--- | :--- |
| CR 301U | Introduction to Conflict | 4 |
|  | Resolution | 4 |
| CR 302U | Peace Studies | 4 |
| CR 303U | Consensus Building | 4 |
| CR 304U | Participating in Democracy | 4 |
| CR 305U | Ecology of War and Peace | 4 |
| CR 306U | Nonviolence: History and | 4 |
|  | Campaign Design |  |
| CR 307 | Conflict Management Skills | 4 |

The Minor is a degree programthat offers students majoring in any field the opportunity to add a conflict resolution component to their studies.
Subtotal: 28

## TRANSFORMATIVE MESSAGING CERTIFICATE

The certificate in Transformative Messaging foregrounds communication skills in multiple social change contexts. The learning in this certificate can augment the work of conflict managers, activists, communication specialists, or students pursuing academic fields that feature the many intersectional and transdisciplinary domains of human communication. The certificate provides theoretical grounding and practical training to navigate this critical area of social and political life.

| Required Courses |  |  |
| :---: | :---: | :---: |
| CR 101 | Nonviolent Interaction | 2 |
| CR 201 | Social Movement Messaging | 2 |
|  |  | Subtotal: 4 |
| Elective Courses |  |  |
| Comm 220 | Public Speaking | 4 |
| Comm | Persuasion | 4 |
| 314 U |  |  |
| Comm 319 | SocialMedia | 4 |
| CR 303U | Consensus Building | 4 |
| CR 306U | Nonviolence: History and Campaign Design | 4 |
| Eng 490 | Advanced Topics in Rhetoric | 4 |


| Psy 343 | SocialPsychology: Social <br> Relationships and Groups <br> Psychology of Stigma \& Social | 4 |
| :--- | :--- | :--- |
| Psy 426 | Inequality |  |
| Wr 228 | Media Writing | 4 |

Subtotal: 12
Total Credit Hours: 16

## Graduate program

## ADMISSION REQUIREMENTS

For admiss ion to graduatestudy, the student's background and preparation should reflect an ability to pursue graduate work in conflict resolution. It is not required that the applicant's undergraduate degree be in any specific academic discipline. Because the programis broadly interdisciplinary, students with any undergraduate degree are encouraged to apply for admis sion. Should the student's preparationbe deemed inadequate in certain areas, the student will be required to overcome those deficiencies through formal coursework and/or directed readings. All such work is separate fromwork toward the master's degree.

Each applicant to the conflict res olution graduate program must submit a statement of purpose explaining his or her reasons for pursuing an advanced degree, along with an academic writing sample of at least ten pages in length. Additionally, each applicant must submit three letters of recommendation fromindividuals closely acquainted with the applicant's academic career and, where applicable, with the applicant's professional background and competencies.
All students are admitted to the programon conditional status. Regular status and retention in the graduate program requires the satisfactory completion of 12 graduate credits with a minimum grade of 3.00 in each course andevidence of satisfactory progress toward the degree.
Students entering this programare expected to develop an understanding and appreciation of the theoretical, conceptual, and methodological breadth of the field and to develop expertise in the pursuit of theirown particular interests in the study of conflict resolution. In conjunction with the student's adviser, each student will design a programbased upon particular interests within the field of conflict resolution.

## GRADUATE CERTIFICATE IN HOLOCAUST AND GENOCIDE/ATROCITY PREVENTION

The Graduate Certificate in Holocaust and Genocide/Atrocity Prevention(H-GAP) will teach students about historic and current genocides and atrocities, and build foundational knowledge of best practices for
identifying threats of atrocities and for implementing strategies to prevent future atrocities. Building upon historic examples of the Holocaust and other atrocities that have shaped the language and scope of the field, students will explore emerging scholarship abouthow identity is sues, climate change, political trends and migration patterns impact therisks of genocide and mass atrocities; and about how to maximize the role of civil society actors, local governments, and international bodies in effective prevention efforts.
All students will complete a programof study to the H GAP Coordinator. Other variable and special topic courses that incorporate more than one dimension of Genocide and Atrocity Prevention can submitted for approval by the H GAP Coordinator.

## REQUIRED COURSES

| CR 549 | Intro to Holocaust and Genocide | 4 |
| :--- | :--- | :--- |
| CR 550 | Studies <br> Holocaust and Genocide/Atrocity | 4 |
| GRN 515 | PreventionSynthesis <br> Constructions of Power and <br> Knowledge: Gender, Race, and <br> Nations | 4 |
|  | Nat |  |

Subtotal: 12

## ELECTIVES

A student will take a minimum of 8 credits offered below:

| BSt 514 | Racism <br> BSt 550 <br> Topics in African/Caribbean | 4 |
| :--- | :--- | :--- |
| CR 527 | History and Culture | 4 |
| Hst 510/Jst | Nationalismand Ethnic Conflict | 4 |
| The Holocaust | 4 |  |
| GRN 520 | Critical and Decolonizing | 4 |
| GRN 530 | Research Methodologies <br> Social Justice Pedagogy <br> GRN 550 | Seminar in Gender, Race, and |
| PS 510 | Nations <br> Genocide | 4 |
| WS 571 | Global Feminisms | 4 |

Subtotal: 8
Total Credit Hours: 20
All courses mustbe taken at the graduate level.
Courses taken under the undifferentiated grading option (pass/no pass) are not acceptable toward fulfilling certificate requirements.

CONFLICT RESOLUTION GRADUATE CERTIFICATE

The graduate certificate in Conflict Resolution offers a mature foundation for any student seeking techniques for engaging and transforming disputes in organizational and community life. The required twenty credits will typically be completed in three terms of study.

|  |  |  |
| :--- | :--- | :---: |
| CR 512 | Foundations of Conflict <br> Resolution | 4 |
| CR 513 | Advanced Values and Ethics in <br> Conflict Resolution | 4 |
| CR 518 | Psychology ofPeace and <br> Conflict | 4 |
| CR 526 | Advanced Intercultural Conflict <br> Resolution <br> Workshop | 4 |

Subtotal: 20

## APPLIED CONFLICT RESOLUTION GRADUATE CERTIFICATE

A stand-alone graduate certificate in Applied Conflict Resolution offers a mature experiential learning for any student seeking state-of-the-art techniques and analy sis for engaging and transforming disputes in organizational and community life. The required 22 credits can be completed in less than one academic year of study and, potentially, within two terms.

| CR 511 | Research Methods in Conflict | 4 |
| :--- | :--- | ---: |
|  | Resolution |  |
| CR 509 | Practicum | 6 |
|  | 12 elective credits at the 500- | 12 |
|  | level(up to 8 credits outside the |  |
|  | programwith advis or approval) |  |

Total CreditHours: 22

## CONFLICT RESOLUTION M.A./M.S.

Students in this programwill study the theoretical, conceptual, and methodological dimensions of conflict resolution. In order to fulfill the MA/MS requirements, each student will design and complete a thesis or project reflective of their interests in the field.

## REQUIRED COURSES

CR 512
Foundations of Conflict
4
CR 513 Advanced Values and Ethics in Conflict Resolution

| CR 518 | Psychology of Peace and <br> Conflict | 4 |
| :--- | :--- | ---: |
| CR 526 | Advanced Intercultural Conflict <br>  <br> Resolution | 4 |
| CR 508 | Workshop | Research Methods in Conflict |
| CR 509 | Resolution | 4 |
| CR 522 | Practicum | 4 |
|  | Thesis and ProjectPreparation | 6 |
|  | Seminar | 4 |

## ELECTIVES

12 credits of 500-level Conflict Resolution courses.

## PROJECT OPTION

In the project option, the MA/MS culminates in project that follows froma programplanned in consultation with the student's adviser. Guidelines for the project proposal are available from the programoffice. Once approved by the adviser and committee, a signed copy of the proposal is filed with the programoffice. Projects ty pically involve a synthesis of learning and practice in service to a community need for a conflict resolution application. Upon completion of the project and write up, the student will present it in an oral examination before a committee compris ing the project adviser, a second reader from among programor PSU faculty and, optionally, a third reader. Projects in their final form are filed in the programoffice.
Students must complete 8 credits of CR 506 for the project option.

## THESIS OPTION

In the thesis option, the MA/MS culminates in the preparation and defense of a thesis based upon original research that follows from a programplanned in consultation with the student's adviser. Guidelines for the thes is proposal are available fromthe program. Once accepted and approved by the adv iser and thesis committee, a signed copy of the proposal is filed with the programoffice. Upon completion of the thesis, each student must defend it in an oralexamination before a thes is committee. Thesis committees typically consist of three faculty members fromPSU, with no more than one member from outside of the CR faculty. After a successful defenseand in accordance with PSU's Procedures for the Master's Degree, the thesis in its final form is filed with the Graduate School.

Students must complete 8 credits of CR 503 for the thesis option.

## Total Credit Hours: 54

Up to 8 credits fromoutside Conflict Resolution may be counted towards fulfilling degree requirements with approval of adviser.

## English

310 Fariborz Maseeh Hall (FMH)
503-725-3521
www.pdx.edu/english/

- B.A., B.S. in English
- B.F.A. in Creative Writing
- Minor in English
- Minor in Film Studies
- Minor in Writing
- Comics Studies Undergraduate Certificate with Baccalaureate
- Secondary Education Endorsement (GTEP)
- M.A.in English
- M.F.A. in Creative Writing
- M.A.,M.S.in Professional and TechnicalWriting
- M.A.,M.S.in BookPublishing


## Undergraduate programs

The study of English has long been considered one of the best ways to obtain a liberaleducation. Courses are designed to develop students' critical capabilities, to deepen their understanding of diversecultural is sues, and to improve their abilities to analyze and produce complex texts. The department prepares its majors for careers in writing and teaching, as well as for a variety of professions in which high levels of literacy and critical thought are required. Indeed, the breadth of knowledge and the communication skills that English majors typically acquire make themattractive to many potential employers and prepare themfor graduate work leading to professions in fields such as law, public policy, administration, and business. For those who wish to teach, the English Department prepares majors for graduate work leading to teaching certification or for entry into graduate master's or doctoral programs in English.

## DEGREE MAPS AND LEARNING OUTCOMES

To view the degree maps and expected learning outcomes for English's undergraduate degrees, go to www.pdx.edu/academic-programs/a-z.

## ADMISSION REQUIREMENTS

Admission to the department is based on general admission to the University. See Admis sions Requirements (p. 8) for more information.

ENGLISH B.A./B.S.

## REQUIREMENTS

In addition to meeting the general University degree requirements, the English major must meet the following departmental requirements:

## I. Critical Approaches and Methods: (8 credits)

These courses reinforce foundational training in close reading, formal and rhetorical analysis, evidence-based argument construction, and research methods that are indis pensable for higher-level work in English.

Students must take both Eng 300 and Wr 301.
Eng 300 is a prerequisite for 400 -level courses. Wr 301 may be taken concurrently with 400 -level courses.
Eng $300 \quad$ Literary Form and Analysis 4 Wr301 Critical Writing in English 4

Subtotal: 8

## II. Historical Literacy: ( $\mathbf{8}$ credits)

These courses provide students with the opportunity to explore different historical periods, regions, and genres, thus enabling themto find connections between multiple topics and cultural moments.

Take two courses from the following list.
Eng 301U Topics in Shakespearean Genre 4
Eng 320U The English NovelI 4
Eng 340U MedievalLiterature 4
Eng 341U Renaissance Literature 4
Eng 342U Eighteenth Century Literature 4
Eng 343U Romanticism 4
Eng African American Literature I 4
351U/BSt
351U
Eng 360U American Literature and Culture 4 I
Eng $416 \quad$ History of Rhetoric 4
Eng 426 Advanced Topics in Medieval 4 Literature
Eng 441 Advanced Topics in Renaissance 4
Eng 450 Advanced Topics in Eighteenth- 4
Century Literature
Advanced Topics in
Romanticism
Eng 460 Advanced Topics in American 4
Literature to 1800
Eng 491 History of Literary Criticismand 4
Theory I
Subtotal: 8

## III. Culture, Difference, and Representation: (4 credits)

These courses explore the politics of representation in the contexts of identity and subject formation, cultural
encounter and domination, and canon formation and contestation.

| Take one course from the following list. |  |  |
| :---: | :--- | :---: |
| Eng 326 | Literature, Community, and <br> Difference <br> Eng 327 | Culture, Imperialism, and |
| Eng 428 | Globalization <br> Canons and Canonicity | 4 |

Subtotal: 4

## IV. Electives: (40 credits)

These courses provide students with the opportunity to pursuetheirown interests and design a purposeful course of study.
Take ten Eng or Wr cours es. At least seven courses (28 credits) must be at the 300 or 400 level. Three ENG courses ( $\mathbf{1 2}$ credits) maybe at the 200 -level; 200-level WR courses do not apply to the English major. Please read the "Notes and restrictions" section below for more information.

Subtotal: 40

## Total CreditHours: 60

## Notes and restrictions

- Eng 300 Literary Form and Analysis is a prerequisite for 400-level courses in the English major.
- Wr301 is expected preparation for 400 -level courses in the English major but may be taken at the same time as $400-l e v e l$ courses.
- Students must take at least 3 courses ( 12 credits) at the 400 level. Eng 404, Wr 404, and Wr 411 Internship credits may not be used to fulfill this requirement.
- Only cours es taken under the differentiated grading option (i.e., a letter grade instead of pass/no pass) can be used to fulfill the requirements of the English major and the minimum grade required is C .
- A minimum of 28 credits in English and/orWriting must be taken at PSU to graduate fromPSU with a major in English.
- In the case of topics courses that may be taken more than once, no more than 8 credits of the same course number will count toward the English major.
- One upper-division literature course (4 credits) in the Department of W orld Languages and Literatures may be used as an elective in the English major with adviser approval.
- Ling 390 Introduction to Linguistics may be used as an elective in the English major.
- Wr200, Wr210, Wr211, Wr222, and Wr 323 will not count toward the English major.
- No more than 8 credits total from the following may be applied to the English major: Eng 401, Eng 402, Eng 404, Eng 405, Eng 408, Eng 409 and Wr 404, and Wr 405.
- No more than 12 credits taken for the minor in Writing may be applied to the English major.
- No more than 8 credits taken for the minor in Film Studies may be applied to the English major.
- Chiron Studies courses will not count toward the English major or the minors in English, Writing, and Film Studies.


## CREATIVE WRITING B.F.A.

## REQUIREMENTS

In addition to meeting university B.A. degree requirements, the Creative Writing major must meet the following requirements for the B.F.A. degree: Literature Courses, Writing Courses, Fine Art Electives, English Electives, Writing Electives, and a Graduation Requirement (Senior Portfolio).

## Fine Art Electives (8 credits)

Two courses in arts appreciation, theory, or performance (8 credits).

This requirement is fulfilled through courses in the College of the Arts prefixed Arch, ArH, Art, D, FILM, Mus, and TA.

## English Electives (12 credits)

12 upper division Eng credits (With adviser approval, one upper-division WLL literature course may be applied to this requirement.)

## Required Literature Courses

Historical Literacy (8 credits)
These courses provide students with the opportunity to explore different historical periods, regions, and genres, thus enabling them to find connections between multiple topics and cultural moments.

Take two courses fromthe following list.
Eng 301U Topics in Shakespearean Genre 4
Eng 320U The English Novell 4
Eng 340U MedievalLiterature 4
Eng 341U Renaissance Literature 4
Eng 342U Eighteenth Century Literature 4
Eng 343U Romanticism 4

| Eng |  |
| :--- | :--- |
| 351U/BSt |  |
| 351U |  |
| Eng 360U | African American Literature I |
|  | American Literature and Culture <br> I |
| Eng 416 | History of Rhetoric <br> Eng 426 <br> Advanced Topics in Medieval <br> Literature <br> Advanced Topics in Renaissance <br> Eng 441 |
| Eng 450 | Literature <br> Advanced Topics in Eighteenth- <br> Century Literature |
| Eng 458 | Advanced Topics in <br> Romanticism <br> Advanced Topics in American <br> Eng 460 |
| Eng 491 | Listature to 1800 |
|  | History of Literary Criticism and <br> Theory I |

## Culture, Difference, and Representation (4 credits)

These courses explore the politics of representation in the contexts of identity and subjectformation, cultural encounter and domination, and canon formation and contestation.

Take one course fromthe following list.
Eng 326 Literature, Community, and Difference
Eng 327 Culture, Imperialism, and Globalization
Eng $428 \quad$ Canons and Canonicity
Required Writing Courses ( 12 credits)
Wr 212 Introductory Fiction Writing
Wr 213 Introductory Poetry Writing
Wr 214 Introductory Nonfiction Writing

## Writing Electives ( $\mathbf{3 2}$ credits)

16 credits in the genre of portfolio (fiction, nonfiction, or poetry), at least 8 of which must be at the 400 -level:
Wr312 Intermediate Fiction Writing 4
Wr313 Intermediate Poetry Writing 4
Wr328 Media Editing 4
Wr399 SpecialStudies 1-5
Wr 407 Writing Seminar 1-6
Wr412 Advanced Fiction Writing 4
Wr413 Advanced Poetry Writing 4
Wr 428 Advanced Media Writing 4
Wr456 Forms of Nonfiction 4
Wr 457 PersonalEssay Writing 4
Wr458 Magazine Writing 4
Wr459 MemoirWriting 4
16 credits of additional upper-division WR courses, 8 of which must be 400-level.

Note: Wr312, Wr313, Wr407, Wr 412, and Wr 413 may be repeated for credit.

## Graduation Requirement: The Senior Portfolio

The Senior Portfolio is submitted for approvalby the end of the third week of the termin which a student intends to graduate. For summer graduates, note that portfolios must be turned in by the end of the third week of spring term. Portfolios will not be accepted over the summer. The portfolio showcases the clean revised copy of the student's creative writing in a chosen genre(i.e., fiction, nonfiction, or poetry) and should contain: (a) An introductory statement of artistic intent (6-10 pages), which provides an overview and analysis of the development and revision of their portfolio work; and (b) Writing within a genre: 30-50 pages (fiction or nonfiction), or 20-30 pages (poetry). Email the portfolio and introductory statement in a DOC format to grdstudy@pdx.edu; it will be forwarded to a departmental committee for review.

The portfolio consists of a Title Page, a Table of Contents, a Statement of Artistic Intent, and your Writing. All pages must be proofread and properly formatted with 1-inch margins, and double-spaced in a readable standard 12point font. (There are no spacing instructions for poems.) All pages except the Title Page should be numbered.

- Title page must include name, date, studentID\#, email address, BFA genre (fiction, nonfiction, poetry), and identify itself as the BFA in Creative Writing Portfolio. Students may additionally title or subtitle the collection if desired.
- Table of Contents must include page numbers, and titles for each piece in your Writing section.
Statement of Artis tic Intent will address a set of prompts available from the ProgramCoordinator and Undergraduate Advisor.
- Writing section may consist of a single or multiple works within BFA genre; they may be thematically connected, but this is not required. Pieces written within courses may be used, and this is indeed encouraged, but they must be clean revised copies. Each piece within the Writing section should be numbered and titled.
- Work will not be judged by its subgenre or subject matter per se, or on its experimental or conventional nature; however, students are expected to carefully analyze and contextualize their artistry in the Statement of Artistic Intent.
- The Statement and Writing will be expected to meet a high standard of aesthetic achievement and writing craft, and to observe University standards of academic honesty.


## Additional Information on Requirements

- Creative Writing majors in upper-division Eng lish courses are expected to be able to write a research paper when required. The department recommends that majors without prior training in research paper writing enroll in Wr222.
- Only courses in which a student receives a Cor above can count for the Creative Writing major.
- Only courses taken for a letter grade can count toward the Creative Writing major.
- No more than 12 credits taken for the Minor in English may be applied to the Creative Writing major.
- A minimum of 24 credits in English and/orWriting at PSU is required to graduate fromPSU with a major in Creative Writing.
Total Credit Hours: 76


## ENGLISH MINOR

## REQUIREMENTS

To earn a minor in English a student must complete 28 adviser-approved credits ( 12 credits of which must be taken in residence at PSU).

- Twelve credits mustbe ENGcourses.
- Sixteen credits must be at the upper-division level.
- No more than 8 credits total and no more than 4 credits in each of the following may be applied to the English minor: Eng 199, Eng 399, Eng 401, Eng 405, Eng 408, Eng 409, Wr 199, Wr 399, and/orWr 405.
- With the exception of upper-divis ion creative writing courses, any course used to satisfy departmental minor requirements must be taken under the differentiated grading option (i.e. a letter grade instead of pass/no pass) and mus thave been assigned a grade of Cor above. Upper-divis ion creative writing courses as signed a grade of pass may apply to the minor.

Note: The following courses will not count as part of the English minor: Wr 115 Introduction to College Writing,
Wr 121 College Writing, Wr 211 Writing Practice, Wr 222 Writing Research Papers.

## WRITING MINOR

## REQUIREMENTS

To earn a minor in writing, a student must complete 28
WR credits ( 12 credits of which must be taken in residence at PSU).

- Sixteen credits mustbe taken at the upper-division level.
- One WIC course may be applied to the minor requirements.
- No more than 8 credits total from the following may be applied to the Writing minor: Wr399, Wr404, Wr 405.
- No more than 8 credits total of courses taken with undifferentiated grading (i.e. Pas s/No Pass) may be applied to the W riting minor.
- Any course used to satisfy the minor requirement must have been as signed a grade of Pas s (undifferentiated grading) or a grade of C or higher (differentiated grading).

Note: The following courses willnot count as part of the Writing minor: Wr 115 Introduction to College Writing, Wr 121 College Writing, Wr 199 Special Studies, Wr 210 Grammar Refresher, Wr 211 Writing Practice, Wr 222 Writing ResearchPapers, or Wr 323 Writing as Critical Inquiry.

## FILM STUDIES MINOR

## REQUIREMENTS

The film studies minor is offered through the Departments of English, Communication, and the School of Film. The minor requires 28 credit hours in appropriate coursework, including internships and adv iser-approved courses at the Northwest Film Center (Note: NWFC operates on a semester system). Students may select froma number of courses listed in various departments throughout PSU. These include courses offered by the Departments of World Languages and Literatures, Art, History, Black Studies, Women, Gender, and Sexuality Studies, Sociology, and others.

| 28 adviser-approved credits must include: |  |  |
| :--- | :--- | ---: |
| FILM 131 | Film Analysis | 4 |
| Eng 304 | Critical Theory of Cinema | 4 |
|  | 20 elective credits with at least | 20 |
|  | 12 upper-division credits |  |

Note: Electives may include additional theory or history classes, as well as classes in film production at the Northwest Film Center. All courses in the minor must be taken for a letter grade. Courses taken for fulfillment of the Minor in Film Studies may also be applied to University Studies requirements.

## Certificates

## COMICS STUDIES UNDERGRADUATE CERTIFICATE WITH BACCALAUREATE

## Application Requirements for Comics Studies Certificate

In order to receive the certificate, students must:

1. be admitted as a PSU student.
2. meet academic standards--Students must have a cumulative GPA of 3.0 in the following categories:
a. all undergraduate course work outside PSU (if applicable)
b. all PSU graded credits.
i. Students who do not meet these standards may apply with a statement explaining their background and academic plans and may be accepted on a probationary status.
3. complete the online application.

To continue in the program, students are required to be in good academic standing, requiring a cumulative 3.00 GPA for all coursework taken at PSU and a termGPA of at least 2.67 each term.

## Application Process

Deadlines: Applications will be accepted on a rolling basis.

Uni versity Application: Complete the University application.
Departmental Application: Complete the application at www.pdx.edu/comics-studies/apply

## The Comics Studies application requires:

A statement of intent: A personal introduction that describes your interest in comics and comic art, your reasons forpursuing the Certificate in Comics Studies, and what most interests you aboutcomics (creation, writing, editing, drawing, his tory, theory, critical scholarship, etc.).
Copies of transcripts frompreviously-attended universities and/orcolleges.

## REQUIREMENTS

Core Requirement
Eng 496 Comics Theory

## Eective Options (Choose 5):

All courses counted towards the Comics Studies Certificate must be completed at Portland State; no transfer credits will be accepted.

Other courses (e.g., internships) may be substituted for electives at the direction of the ProgramDirector.

| Other courses in additional departments TBA. |  |  |
| :---: | :---: | :---: |
| Art 297 | Book Arts | 4 |
| Art 2/399 | Creating Short Comics: Practical Comic Creation | 4 |
| Art 356 | Visual Storytelling | 4 |
| Art 370 | Topics in Printmaking | 4 |
|  | Techniques |  |
| Art 455 | Time-Based Art Studio | 4 |
| Eng 306U | Topics in Literature and Popular Culture | 4 |
| Eng 410 | Special Topics in Comics Studies | 4 |
| Eng 497 | Comics History | 4 |
| Jpn 343 | Topics in Japanese Literature (In Translation) | 4 |
| Phl 317U | Philosophy of Art | 4 |
| WLL 448U | Major Figures in World Literature | 4 |
| Wr 300 | Topics in Composition | 4 |
| Wr 398 | Topics:Writing Comics | 4 |
| Wr 400 | Special Topics: Advanced Writing for Comics | 4 |
| Wr 460 | Introductionto Book Publishing | 4 |
| Wr 462 | Book Design Software | 4 |

Subtotal: 20
Please note that Wr 398 may be repeated for credit.
Eng 410: Special Topics in Comics Studies, listed above as an elective option, may include courses such as:

- Editing Comics
- Focus on Frank Miller/Will Eisner
- European Comics
- Autobiographical Comics
- Superheroes and Society
- Censorship and the Comics Code


## Completion Requirements

To be awarded the certificate, students must complete the core requirement and 5 elective courses (for 24 total credits) with a grade of C or higher (or Pass) foreach course.

## SECONDARY EDUCATION ENDORSEMENT (GTEP)

Forstudents whocompletea major in English and wish to teach Language Arts in middle orhigh schools, PSU's Graduate School of Education offers a M.Ed. with certification in Language Arts through their Graduate Teacher Education Program(GTEP). Applicants to the

GTEP programin Language Arts must complete specific prerequisites in the content area with grades of B - or better. PSU English majors may do this as part of their major requirements: early consultation with the department's Language Arts content area advisor can streamline this process and is strongly recommended for students interested in careers in secondary education.

## Graduate Programs in English

## ENGLISH M.A.

The Department of English offers graduate work leading to the Master of Arts degree, which is designed forstudents who are prepared to undertake advanced work in the field. The programprovides a range of courses in literatures in English, including British, American, and Anglophone literature; composition and rhetorical theory; cultural studies; and literary history, theory, and critical methods. Students in the programgo on to work in humanities related fields fromhigher education and $\mathrm{K}-12$ teaching to arts education and public relations; still others pursue the degree solely for their own interest and enrichment.

## Admission Requirements

The application deadline is January 15th.

- Applications received after this date may not be reviewed.
- Applicants will be asked to submit the following through the online application found at http://www.pdxedu/english/graduate-admis sions:
-A minimum of two letters of academic recommendation
-Statement of purpose of study
-A sample of recent academic writing totaling 1520 pages
-A complete set of transcripts
Applicants are expected to have extensive experience in literary studies, es pecially English language and literature. Applicants who do not already have a bachelor's degree in English are expected to have taken 20-30 credit hours in literatures in English and writing, so that they come into the program with a knowledge of literary history, excellent writing skills, and experience doing ad vanced critical analys is in upper-division coursework. Applicants are also expected to have a minimum GPA of 3.25 in all English courses.

Those who do not meet these requirements may be considered for conditional admis sion. They will need to provide satis factory evidence of preparedness to undertake advanced work. Their application will need to include:

- 3.25 GPA in four or five graduate English courses
- Explanation of undergraduate record and purpose of study
- Two samples of written work from recent English courses

Students whosenative language is not English mustscore at least 600 on the TOEFL paper examination, at least 100 total on the internet-based exam, and at least 250 on the computer-based exam.

## REQUIREMENTS

See Univers ity master's degree requirements (p. 52). Department requirements are described in detail on the English Department website and in the MA in English Handbook, which is also available on the website.
For the M.A., the department requires a minimum of 32 graduate credits in English (courses prefixed with "Eng"), including Eng 500 Problems and Methods of Literary Study, Eng 507 Seminar, 4 credits of pre-1800British or American literature, 4 credits in literature or rhetoric, whether Anglophone or in translation, before 1900, and 4 credits of fritical theory. The remainder of the student's programmay, with the approval of the adviser, include coursework in fields related to English. A minimum of 45 graduate credits is required for the M.A. in English.

All students must take the oral field exam. Students interested in developing a specific research topic also have the option of writing an extended es say of approximately 8,000 words in addition to the oral field exam. This option requires the approval of the student's advisor and the M.A. Director. Further details on the oral field exam and the optional extended es say are available fromthe department's Academic and ProgramCoordinator.

## Graduate Programs in Writing

The Department of English offers graduate work leading to the M.F.A. in Creative Writing (Fiction, Nonfiction, and Poetry), the M.A. or M.S. in Book Publishing, and the M.A. or M.S. in Professional and Technical Writing.

## CREATIVE WRITING M.F.A.

The M.F.A. degree offers an intensive program of writing in small, core workshops and seminars taught by es tablished writers. In works hop, students engage in close readings and critiques of their peer's work, while recent seminars have included Forms, Defamiliarization, Constraint-based Writing, Fragments, and Aspects of Translation.

Prospective students must apply to the strand in which they want to focus: fiction, nonfiction, or poetry. Seminars and Core workshops and eight credits of seminar are taken in the student's primary strand, while electives allow students to explore other strands, as well as classes in the larger English Dept and outside of the department. The M.F.A.
emphasizes faculty mentorship throughout each student's coursework and thesis completion. Engagement in Portland's vibrant community of writers is also central to the development of our students' work.
Many students come to the M.F.A. with a background in English literature, writing or journalis $m$, but others have backgrounds in the social sciences, sciences, and fine arts. Our programis further distinguished for the diversity of its student body, including a range of ages and life experience, as well as for its flexibility. The programcan be completed in two years of full-time coursework, butstudents have up to fouryears to complete the degree in order to accommodate those who choose to attend part-time or want to take additional courses.

## Admission Requirements

Applicants to the M.F.A programmust provide s atisfactory evidence of preparedness to undertake advanced work, which would include a B.A.,B.F.A., or B.S. degree froma regionally accredited college or university and a 3.25 GPA in undergraduate work. The application deadline is January 15. Applicants must submit the following:

Applicants must submit the following, using the online application process:

- A Departmental application formindicating the strand they will focus on: fiction, nonfiction, or poetry.
- Three letters of recommendation fromindividuals who can speak to your creative and intellectualwork, and your ability to successfully undertake graduate work.
- A 500-700 word statement describing the applicant's background as a writer, goals, and interest in this particular program.
- A transcript fromevery post-secondary institution you have attended. Unofficial transcripts or photocopies are acceptable for the Department application.
- A manuscript in the applicant's primary strand. Manuscript formis defined as having one inch margins, double-spaced text, a single, clear, 12-point typeface, no extra space between paragraphs, indented first line for each paragraph, information identify ing the author and title of the manuscript on every page, and page numbers. Poetry manuscripts may be single-spaced; each poemshould begin on a new page. Only singleauthored work will be accepted. Manuscripts should demonstrate mastery of basic craft and literary promise, and should represent your best work regardless of whether or not it has been published. W riting samples can be comprised of one or multiple bodies of work equal the page requirements listed below.
-In poetry: 12-15 pages
-In fiction: 20-30 pages
-In nonfiction: 20-30 pages of magazine articles or creative nonfiction

Writing Samples and optional additional material in the form of a CV or resumé may be uploaded in one of the following supported file types: PDF, DOC, DOCX, RTF, or TXT.

Note: Graduate Record Examination(GRE) scores are not requiredfor admission to the M.F.A. in Creative Writing program.

## REQUIREMENTS

| Courses |  |  |
| :--- | :--- | ---: |
|  | MFA Core Workshops | 16 |
|  | Wrseminars in Strand | 8 |
|  | Electives | 16 |
| Wr 503 | Thesis | 8 |

Subtotal: 48
Core Workshops (4classes): WR 521, WR522, and WR 523 are restricted to students admitted to the M.F.A. in the strand. Students will take the Workshop in their strand no fewer than fourtimes and no more than sixtimes, to earn a minimum of 16 credits. First-year students are required to take core workshops in their first two terms.
WR Seminars in Strand (2 classes): Seminars must focus on the student's strand (i.e. fiction, nonfiction, or poetry) or be a cross-genre course which includes thestudent's strand. Fiction seminars are all listed as WR 507: Fiction; poetry seminars are all listed as WR 507: Poetry, and nonfiction seminars include WR 507: Nonfiction. Other MFA seminars may be included by advis or approval.
Electives (4classes): Graduate ENG and/or WR courses chosen from within the department. Of these, students are encouraged to take at least one WR 507 seminar outside of their genre. Up to 8 credits may be taken in LING 590, TA 574 , or TA 575 or, with advis or approval, in graduate courses outside the department in an area related to the student's thesis.

## Wr 503 Thesis: ( 8 credit hours to be arranged)

M.F.A. students also complete a creative thesis of high literary merit, pass a written examination based on the thes is, and pass an oral examination based on the written examination and creative thesis.

## BOOK PUBLISHING M.A./M.S.

The Department of English offers graduate work leading to the Master of Arts orMaster of Sciencein Book Publishing. The 48 -credit M.A./M.S. in BookPublishing is des igned for students who are prepared to undertake advanced work in the field. Courses are taught in areas such as editing, design, online documentation, and information technology.

The programhas rolling admissions which follow the University's admis sion deadlines as follows: April 1st for Fall admission; Sept. 1st for Winter; and Nov. 1st for Spring.
Please note that Graduate Assis tantship applications can only be accepted fromfall term applicants, who must meet the April 1 deadline. BookPublishing also awards Graduate Assistantships in the second year of the program for one year only; the deadlines for application will be announced within the programannually, and receiving such an appointment is conditionalon the appointee remaining for the entire coming school year.

## Admission Requirements

Admis sion to graduatestudy is granted on the basis of evidence of suitable preparation and the probability of success in the intended field of study; strong writing skills are considered central. Applicants do not need to have a previous degree in English or Writing, but must hold a B.A. or B.S. degree froma regionally accredited college or university. Applicants must also submit the following:

- A letter of introduction.
- A complete set of transcripts. A transcript fromeach post-secondary institution you have attended is required. Unofficial transcripts or photocopies are acceptable. You will be asked to upload a transcript for each institution in one of the following supported file types: PDF, JPG, PNG, GIF, or TIF.
- A minimum of three letters of recommendation.
- A writing sample of fifteen to thirty pages of writing that demonstrates your potential as a publishing profes sional. Previously published work is welcome, and your sample can consist of multiple pieces, solong as they do not exceed the page limit. Your sample can be of a professional, academic, or artistic nature (or a mixture of the three). Indeed, a diversity of materials is often most effective at demonstrating your strengths as a prospective student for the graduate programin Book Publishing. If you have editing or design experience, samples of this work are welcome, but in these instances, please be sure to include a brief cover letter that details your role in these projects. With editing samples, it's particularly important that we can actually see the editing you've done; oneway to achieve this is to submit both pre- and post-editing versions, another is to submit a document with your copyediting marks handwritten on it, and yet another is to submit a document with track changes.

You will be asked to upload your writing samples and optional material such as a C.V. or resume in one of the following supported file types: PDF, DOC, DOCX, RTF, or TXT.

Note: Graduate Record Examination(GRE) scores are not requiredfor admission.

## REQUIREMENTS

Students will complete 24 core credits ( 6 courses), 12 elective credits ( 3 courses) in writing, and 12 elective credits ( 3 courses) that may involve coursework in another discipline with Adviser's approval. Of the 24 elective credits, candidates are expected to take a total of eight (8) credits working at Ooligan Press in either or both Wr 574 Publishing Studio or Wr 575 Publishing Lab.

The final project, in addition to completing the coursework, will be a portfolio of work demonstrating competence at a professional level, but with adviser approval, may be a single, substantive work. Upon completion and delivery of the final project or portfolio to the student's orals committee, a topic will be assigned by the student's adviser for a final paper of approximately 4000 words (excluding front matter and back matter).

The student will take an oral exam in defense of the final project and finalpaper. Work included in a portfolio will be representative of that done in each course, and appropriate to it, but may otherwise focus in greater detail on one or more areas of study. For instance, the portfolio may include samples of editorial work, query letters for fiction and nonfiction books, book marketing plans, book design proposals and finished designs, research and writing on issues in contemporary publishing. Other possibilities are negotiable with the assigned graduate adviser in Book Publishing.

## Core Courses ( $\mathbf{2 4}$ credits)

Students choose 6 out of 7 available core courses to satisfy the 24 -credit requirement.
Wr 560 Introductionto Book Publishing 4
Wr561 BookEditing 4
Wr562 BookDesign Software 4
Wr563 BookMarketing 4
Wr 564 Business of Book Publishing 4
Wr 566 Digital Skills 4
Wr 579 Researching Book Publishing 4

## Electives ( 24 credits)

24 credits fromother writing courses, from literature courses, or from another discipline.

Students earn eight (8) of their elective credits by participating in the work of Oolig an Press, a s mall trade publishing house. Students work in groups to review, accept, and edit manuscripts; design the interior and the exterior of books; send books to press; and market the books to booksellers, libraries, and other outlets.

Note: the M.S. option does not require students to demonstrate proficiency in a language other than English. In cases where a student does opt to demonstrate proficiency in a language other than English, the M.A. in Writing: Book Publishing will be awarded.
Subtotal: 48

## PROFESSIONAL AND TECHNICAL WRITING M.A./M.S.

The Department of English offers graduate work leading to the Mas ter of Arts in Writing and the Master of Science in Professional and Technical Writing. The 48-credit M.A./M.S. in Professional and Technical Writing is designed for students who are prepared to undertake advanced work in the field. The programis designed for those who wish to work in the professional writing industry.
The programhas rolling admissions which follow the University's admis sion deadlines as follows: A pril 1st for Fall admis sion; Sept. 1st for Winter; and Nov. 1st for Spring.
Please note that Graduate Assis tantship applications can only be accepted fromfall term applicants, who must meet the April 1 deadline.

## Admission Requirements

Admis sion to graduatestudy is granted on the basis of evidence of suitable preparation and the probability of success in the intended field of study; strong writing skills are cons idered central. A pplicants do not need to have a previous degree in English orW riting, but must hold a B.A. or B.S. degree from regionally accredited college or university. Applicants must also submit the following:

- A letter of introduction.
- A complete set of transcripts. A transcript fromeach post-secondary institution youhave attended is required. Unofficial transcripts or photocopies are acceptable. You will be asked to upload a transcript for each institution in one of the following supported file types: PDF, JPG, PNG, GIF, or TIF.
- A minimum of three letters of recommendation.
- A writing sample of fifteen to thirty pages from customary genres, including (but not limited to) descriptions, specifications, computer documentation, proposals, memoranda, formal reports, newsletters, online documentation, or web pages. Writing samples should represent your best work and demonstrate mastery of bas ic craft and promise of success in technical/professional writing. Your writing sample can be comprised of one or multiple bodies of work equal to the page requirements listed above.
You will be asked to upload your writing samples and optional material such as a C.V. or resume in one of the following supported file types: PDF, DOC, DOCX, RTF, or TXT.
Note: Graduate Record Examination (GRE) scores are not requiredfor admission.


## REQUIREMENTS

The department requires a minimum of 28 graduate credits in writing. The remainder of the student's programmay, with the approval of the adviser, include coursework in fields related to writing. In every case, the student's programmust be approved by the adviser.
Students will complete 16 core credits (4 courses), 20 technical writing elective credits ( 5 courses), and 12 credits ( 3 courses) of open electives that may involvecoursework in another discipline.
Students will be required to submit a final project in addition to completing their course work. This project will be either a portfolio of their work demons trating competence at a professional level or a research-based thes is.

Note: the M.S. option does not require students to demonstrate proficiency in a language other than English. In cases where a student does opt to demonstrate proficiency in a language other than English, the M.A. in Professional and TechnicalW riting will be awarded.

## Core Courses (16 Credits)

4 courses formthe foundation of the curriculum. These 4 courses reflect the curriculum's balanced attention to critical academic inquiry and professionalization for work in industry, government or the non-profit sector. Core courses do not have to be taken sequentially, although students starting in the fall quarter are advised to enroll in WR 525 their first term.

| Wr 525 | Advanced Technical Writing | 4 |
| :--- | :--- | :--- |
| Wr 531 | Advanced Topics in Technical <br> Wr 532 | Writing Technologies |
|  | Frameworks for Technical | 4 |
| Wr 533 | Writing | 4 |
|  | Research Methods for Technical <br> Writers | 4 |

Technical Writing Electives (20 Credits)
Wr $510 \quad$ Selected Topics in Writing 0-6
Wr524 Grant Writing for Professional 4
Wr526 Document Design 4
Wr527 TechnicalEditing 4
Wr529 Writing Computer 4
Documentation
Wr531 Advanced Topics in Technical 4
Wr 560 Introduction to Book Publishing 4
Wr572 Copyediting 4
Wr $562 \quad$ BookDesign Software 4
Wr 566 Digital Skills 4
Wr565 Intellectual Property and 4

| Eng 513 | Teaching and Tutoring Writing | 4 |
| :--- | :--- | :--- |
| Eng 514 | Composition Theory | 4 |
| Eng 515 | Research Methods in Rhetoric <br> and Composition | 4 |
| Eng 590 | Advanced Topics in Rhetoric | 4 |
| Eng 516 | History of Rhetoric | 4 |
| Eng 525 | Practical Grammar | 4 |

## Open Electives (12 Credits)

Students may take any additional 500-level courses in Wr or Eng.
Students may also use open elective credits to tailor their degree to their interes ts using the by-arrangement options below:

| Wr 501 | Research | $1-12$ |
| :--- | :--- | ---: |
| Wr 502 | Independent Study | $1-6$ |
| Wr 503 | Thesis | $1-12$ |
|  |  |  |
| Wr 504 | Cooperative Education/Internship | $1-9$ |
|  | or |  |
| Wr 511 | Internship | $1-4$ |
|  |  |  |
| Wr 505 | Writing and Conference | $1-6$ |
| Wr 509 | Practicum | $1-9$ |

Wr 503 Thesis: 6-9 credits fors students pursuing the thesis option. Minimumof 6 credits required for thesis option students.

Students are limited to a combination of 8 credits of Wr 501, Wr 502, Wr 505 and Wr 509, and a combination of 8 credits of Wr 504 and Wr 511.

Student may also do relev ant graduate coursework outside of the department for open electivecredit with approval from the Director of Profes sional and Technical Writing. Relevant courses are commonly offered in Communications, Applied Linguistics and The School of Business, although other units may also offer relevant courses.

| Students with a GTA teaching appointment are |  |  |
| :--- | :--- | :--- |
| required to take the following courses: |  |  |
| Eng 518 | College Composition Teaching | 1 |
| Eng 519 | Advanced College Composition | 1 |
|  | Teaching |  |
| Wr 509 | Teaching Technical Writing | 1 |
| Subtotal:48 |  |  |

## Environmental Science and Management

218 Science Research and Teaching Center (SRTC) 503-725-4982
www.pdx.edu/environmental-science

- B.A., B.S. in EnvironmentalScience
- B.A., B.S. in EnvironmentalStudies
- Minor in Climate Change Science and Adaptation
- Minor in EnvironmentalScience
- Minor in Sustainability
- Certificate in Lake and Reservoir Management
- M.S., M.E.M., P.S.M.
- Ph.D. via Earth, Environment and Society Doctoral Program
- Graduate Certificate in Hydrology

Environmental science and management is the study of the interactions among society and the physical, chemical, ecological, and biological processes that structure and maintain ecos ystems. Our work is critical to understanding and developing sustainable ecosystems, human societies, and economies. EnvironmentalScience and Management at PSU focuses on processes that link terrestrial, urban and aquatic ecosy stems, consequences of human alteration of those linkages, and development of policies to manage human interaction with theenvironment. Weconduct our research by studying organisms and specific linkages and processes across systems and by studying interactions between organis ms, processes, and linkages in a specific ecosystemor watershed, such as the Columbia River Basin. The Department of Environmental Science and Management prepares students to develop the skills and interd isciplinary understanding to be scholars and managers of human interaction with, and impact on, environmental systems.
The Department of Environmental Science and Management cooperates with several departments and centers, including the departments of Anthropology, Biology, Chemistry, Civil Engineering, Economics, Geography, Geology, History, Mathematics, Physics, Political Science, Sociology; and the School of Business Adminis tration and the College of Urban and Public Affairs.

## Undergraduate programs

The Department of Environmental Science and Management offers two undergraduate degrees. The Environmental Science degree is focused on natural science, whereas the Environmental Studies degree is focused more on policy and management. The B.A./B.S. degrees in both Environmental Science and Environmental Studies reston an interdisciplinary curriculum that develops understanding and expertise in environmental science by building on a foundation in mathematics, natural sciences, and economics complemented by related courses in environmental policy and management. Students should consult with their department adviser to as sure proper course planning. Students can complete field
experiences by working on projects in the University, metropolitan community, and region.

## DEGREE MAPS AND LEARNING OUTCOMES

To view the degree maps and expected learning outcomes for Environmental Science and Management's undergraduate degrees, go to www.pdx.edu/academic-programs/a-z.

## ADMISSION REQUIREMENTS

Admis sion to the department is based on general admis sion to the University. See page Admissions Requirements (p. 8) for more information.

## ENVIRONMENTAL SCIENCE B.A./B.S.

The Environmental Science degree is focused on natural science and is offered with two track options, a focus on the scientific and field study of the environment (Science track) or a focus on en vironmental management and policy (Management track).
In addition tosatis fying general University requirements ( 45 credits), the EnvironmentalScience and Management degree requires $74-87$ core credits plus $30-31$ credits in either the Science or Management track.
All courses used to satisfy the Environmental Science major requirements, whethertaken in the department or in other departments, must be graded C - or above. Department requirements are listed below.

## REQUIREMENTS

Students must complete the core requirements and either the Science Track or the Management Track.

## CORE REQUIREMENTS

Students must complete the ESM, Biology, Chemistry, and GIS requirements.
ESM Core

| ESM 150 | Orientation to Environmental <br> Sciences and Management | 1 |
| :--- | :--- | :--- |
| ESM 220 | Introductionto Environmental | 4 |
| ESM 221 | Systems <br> Applied Environmental Studies: <br> ProblemSolving | 4 |
| ESM 222 | Applied Environmental Studies: <br> Policy Consideration | 4 |
| ESM 335 | Introductionto Environmental | 4 |
| ESM 340 | Management <br> Research Methods in <br> Environmental Science | 4 |
| ESM 407 | Environmental Seminar <br> Technical Report Writing | 1 |
| Wr327 | Tren |  |

12 credits in 400-level topical
area
16 credits of 400-levelESM
courses (excluding ESM 407)
Up to 4 credits of approved research/internship can replace 4 credits of 400 -level ESM courses.

## Biology Core (Option 1)

8 credits selected fromthe following:

| Sci 341U | Biology Concepts and <br> Applications I | 4 |
| :--- | :--- | :--- |
| Sci 342U | Biology Concepts and <br> Applications II <br> EnvironmentalProblemSolving: <br> ESM 343 <br> festoring EcosystemDamage | 4 |
| from Human Impacts |  |  |

## Biology Core (Option 2)

15 credits of the following:
Bi 211 Principles of Biology: Biology of 4 Cells
Bi 214 Principles of Biology Lab I 1
Bi 212 Principles of Biology:The 4
biology of organis $m s$
Bi $215 \quad$ Principles of Biology Lab II 1
Bi 213 Principles of Biology:Evolution 4
and ecology of living organisms
Principles of Biology Lab III
Bi 216 Principles of Biology Lab III 1
Chemistry Core (Option 1)
ESM 230 Fundamentals of Environmental 4 Chemistry I
ESM 231 Fundamentals of Environmental 4 Chemistry II

## Chemistry Core (Option 2)

Ch 221 General Chemistry I 4

Ch 227 General Chemistry Laboratory $\quad 1$
Ch 222 General Chemistry II 4
Ch 228 General Chemistry Laboratory 1

## GIS Core (Option 1)

4 credits selected from the following:
G 424 Geographical Information

G 425 Field GIS
GIS Core (Option 2)
8 credits of the following:
Geog 380U Maps and Geographic 4

Geog Geographic Information Systems 4
488/USP I: Introduction
591
Subtotal: 74-87

## SCIENCE TRACK

| ESM 320 | EnvironmentalSystems I | 4 |
| :---: | :---: | :---: |
| ESM 323 | Environmental Systems | 2 |
|  | Laboratory I |  |
| ESM 321 | Environmental Systems II | 4 |
| ESM 324 | Environmental Systems | 2 |
|  | Laboratory II |  |
| ESM 322 | Environmental Risk Assessment | 4 |
| ESM 325 | Environmental Risk Assessment Lab | 2 |
| ESM 315 | Environmental Sampling and Contaminant Analysis | 4 |
|  | or | 4 |
| Ch 229 | General Chemistry Laboratory | 1 |
|  | 4 credits Geology or Physics, 200-level or above. | 4 |
| Mth 112 | Introductory College | 4 |
|  | Mathematics II |  |
|  | or |  |
| Mth 251 | Calculus I | 4 |
| Subtotal: 30-31 |  |  |
| M ANAGEM ENT TRACK |  |  |
| ESM 330 | Environmental and Ecological | 4 |
|  | Literacy |  |
| ESM 333 | Methods of Data Collection, | 4 |
|  | Analysis, Representation, and |  |
|  | Modeling for Environmental |  |
|  | Managers |  |
| ESM 334 | Methods of Data Collection, | 2 |
|  | Analy sis, Representation, and |  |
|  | Modeling for Environmental |  |
|  | Managers Lab |  |
| ESM 487 | Environmental Justice | 4 |
| Ec 332U | Economics of Environmental | 4 |
|  | Issues |  |
| ESM 435 | Natural Resource Policy and | 4 |
|  | Management |  |
| Mth 112 | Introductory College | 4 |
|  | Mathematics II |  |
| Geog 210 | PhysicalGeography | 4 |
| Subtotal: 30 |  |  |

Total CreditHours: 104-118

## REQUIREMENTS

This programis forstudents who are interested in understanding environment-society interactions through a socialsciencelens. This will help prepare students seeking to enterenvironmental policy and governance careers, as well as those seeking to contribute to environmental success stories and informpositive socio-environmental change.

Future careers for students in this major could include environmental policy, local, stateorfederal environmental agencies, environmental law, environmental governance and management, en vironmental consulting, environmental education, environmental nonprofits, and graduate work in human-environment studies. The major focuses on providing social science foundations, including critical theoretical and humanities approaches, with a focus on equity, justice and policy applications.

This major is distinct from the Environmental Sciences major (science track and management track) which focuses more explicitly on science and would be appropriate for students seeking science-based careers. While this major includes basic scientific foundations in climate and ecosystemscience, it does not in volve extensive science credits and instead takes an interdisciplinary social science focus.

Students taking the Environmental Studies major are encouraged to pursue minors and certificates to complement the major and to focus on specific areas of interest, including: Climate science(ESM/GEOG); water resources (GEOG); GIS (GEOG); environmental science (ESM); sustainability (ESM).

## Core Courses

Core courses will give students basic foundations in natural science, social science, environmental justice, policy, and methods in environmental studies.

| Critical social science andenvironmental justice <br> foundations <br> Geog 230 | Environment and Society: Global <br> Perspectives <br> or | 4 |
| :---: | :--- | :---: |
| ESM 330 | Environmental and Ecological <br> Literacy | 4 |
| Geog 345U | Resource Management <br> or |  |
| Geog 348U | Culturaland PoliticalEcology | 4 |

Environmental management and policy foundations
ESM 222 Applied Environmental Studies:
4 Policy Consideration
ESM 335 Introduction to Environmental 4

| Natural sciencefoundations |  |  |
| :---: | :---: | :---: |
| ESM 220 | Introductionto Environmental | 4 |
|  | Systems |  |
| Geog 210 | Physical Geography | 4 |
| Mth 111 | Introductory College | 4 |
|  | Mathematics I |  |
| Mth 111 may be waived with ALEKS math placement score of 60 or above. |  |  |
| Methods |  |  |
| ESM 333 | Methods of Data Collection, | 4 |
|  | Analysis, Representation, and |  |
|  | Modeling for Environmental |  |
|  | Managers |  |
| ESM 334 | Methods of Data Collection, | 2 |
|  | Analysis, Representation, and |  |
|  | Modeling forEnvironmental |  |
|  | Managers Lab |  |
| ESM 342 | Field Methods | 2 |
| Geog 380U | Maps and Geographic | 4 |
|  | Information |  |
| Electives |  |  |
| Electives include 300-and 400-level clas ses. At least 4 classes ( 16 credits) must be at the 400 level, including at least 1 class in ESM and 1 class in GEOG. |  |  |
| Students will take 6 elective courses with at least 4 from within 1 focal area. |  |  |
| Students may work with advis ors to substitute other courses not on these lists (for example, relevant courses with a 410 course number). |  |  |
| Focal Areas |  |  |
| At least 4 of the 6 electives must come fromone of the following areas: |  |  |
| Environmental justice and environmental humanities |  |  |
| Anth 414 | Culture and Ecology | 4 |
| Anth 418 | Environmental Anthropology | 4 |
| BSt 304 | The Civil Rights Movement | 4 |
| BSt | African History, Before 1800 | 4 |
| 305U/Hst |  |  |
| BSt 325U | Race and Ethnicity in Latin | 4 |
|  | America |  |
| BSt 357U | Caribbean Spirituality and | 4 |
|  | Resistance |  |
| BSt 412 | Oregon African American | 4 |
|  | History |  |
| BSt 414 | Racism | 4 |
| BSt 484 | African American Community | 4 |
|  | Development |  |
| CFS 488 | Structural Oppression | 4 |
| CFS 489 | Activismfor Social Change | 2 |


| ESM 487 | Environmental Justice | 4 |
| :---: | :---: | :---: |
| ELP 349U | Gandhi, Zapata andNew | 4 |
|  | Agrarianism |  |
| ELP 418 | Permaculture \& Whole Systems | 4 |
|  | Design: Principles and Practices |  |
|  | for Sustainable Systems |  |
| Eng 368U | Literature and Ecology | 4 |
| Geog 348U | Cultural and Political Ecology | 4 |
| Geog 430 | Cultural Geography | 4 |
| Geog 462 | Sense of Place | 4 |
| Geog 467 | Community Resilience in | 4 |
|  | Coupled Socio-Ecological |  |
|  | Systems |  |
| Hst 339U | The Environment and History | 4 |
| Hst 440 | American Environmental | 4 |
|  | History |  |
| Hst 491 | Reading Seminar | 4 |
| NAS 342 | Indigenous Gardens and Food | 4 |
|  | Justice |  |
| NAS 348 | Indigenous Practices for | 4 |
|  | EnvironmentalSustainability |  |
| NAS 392 | Indigenous Ways of Knowing | 4 |
| NAS 407 | Indigenous Ecological Healing | 4 |
|  | Practices |  |
| PHE 443U | Environmental Health | 4 |
| PHE 450 | Epidemiology | 4 |
| PHE 452U | Gender, Race, Class and Health | 4 |
| Phl 310U | EnvironmentalEthics | 4 |
| Phl 449 | Philos ophy of Sustainability | 4 |
| Psy 413 | Ecops ychology | 4 |
| Soc 320U | Globalization | 4 |
| Soc 330 | Sociology of Food Inequalities | 4 |
| Soc 337U | Prejudice, Privilege, and Power | 4 |
| Soc 465 | Environmental Sociology | 4 |
| SySc 350U | Indigenous and Systems | 4 |
|  | Perspectives on Sustainability |  |
| WS 306U | Global Gender Issues | 4 |
| WS 308U | Topics in Gender, Literature, and | 4 |
|  | PopularCulture |  |
| WS 332U | Race, Class, Gender, and | 4 |
|  | Sexuality in the United States |  |
| WS 369U | Global Reproductive Justice | 4 |
| WS 375U | Topics in Sexuality Studies | 4 |
| Environmental policy and governance |  |  |
| CR 305U | Ecology of Warand Peace | 4 |
| CR 313 | EnvironmentalConflict | 4 |
|  | Resolution |  |
| Ec 332U | Economics of Environmental | 4 |
|  | Issues |  |
| Ec 430 | Resource and Environmental | 4 |
|  | Economics |  |
| Ec 438 | Energy Economics | 4 |
| ELP 348U | Introduction to Global Political | 4 |
|  | Ecology |  |
| Eng 498 | Ecology, Criticism, and Culture | 4 |


| ESM 429 | Environmental Impact | 4 |
| :---: | :---: | :---: |
|  | Assessment |  |
| ESM 435 | Natural Resource Policy and | 4 |
|  | Management |  |
| ESM 463 | WaterQuality Policy \& | 4 |
|  | Management |  |
| ESM 464 | Climate Adaptation: Managing | 4 |
|  | Environmental Risks and |  |
|  | Vulnerabilities |  |
| ESM 483 | Marine Conservation and | 4 |
|  | Management |  |
| Geog 347U | Environmental Is sues and Action | 4 |
| Geog 412 | Global Climate Change Science | 4 |
|  | and Socio-environmental Impact Assessment |  |
| PS 319U | Politics of the Environment | 4 |
| PS 389U | Environmental PoliticalTheory | 4 |
| PS 449 | International Environmental | 4 |
|  | Politics and Law |  |
| PS 477 | Global Food Politics and Policy | 4 |
| Resource man | gement and sustainable systems |  |
| ESM 355U | Understanding Environmental | 4 |
|  | Sustainability I |  |
| ESM 356U | Understanding Environmental | 4 |
|  | Sustainability II |  |
| ESM 416 | EcosystemRestoration | 4 |
| ESM | Landscape Ecology | 4 |
| 418/Geog |  |  |
| 418 |  |  |
| ESM 420 | Ecological Toxicology | 4 |
| ESM 424 | Wetland Ecology | 4 |
| ESM 425 | W atershed Hydrology | 4 |
| ESM 427 | Watershed Biogeochemistry | 4 |
| ESM 428 | Urban Ecology | 4 |
| ESM | The Ecology \& Management of | 4 |
| 440/Geog | Wildfire |  |
| 440 |  |  |
| ESM 444 | Forest Ecology | 4 |
| ESM 462 | Climate Change Impacts, | 4 |
|  | Adaptations and Responses: |  |
|  | Geosphere and Anthrosphere |  |
| ESM 480 | Coastal Marine Ecology | 4 |
| ESM 485 | Ecology and Management of | 4 |
|  | Bio-Invasions |  |
| Geog | Climate and W ater Resources | 4 |
| 310U/Sci |  |  |
| 333 U |  |  |
| Geog 311U | Climatology | 4 |
| Geog | Climate Variability and Change | 4 |
| 312U/Sci |  |  |
| 334 U |  |  |
| Geog 313U | Biogeography | 4 |
| Geog 314U | Severe Weather | 4 |
| Geog 320/G | Geomorphic Proces ses | 4 |
| 374 |  |  |


| Geog 322U | Alpine Environments | 4 |
| :---: | :---: | :---: |
| Geog | Weather | 4 |
| 333U/Ph |  |  |
| 333 U |  |  |
| Geog 340U | Global Water Issues and | 4 |
|  | Sustainability |  |
| Geog 345U | Resource Management | 4 |
| Geog 346U | World Population and Food | 4 |
|  | Supply |  |
| Geog 412 | Global Climate Change Science and Socio-environmental Impact | 4 |
|  | Assessment |  |
| Geog 413 | Dis turbance Biogeography of Pacific Northwest | 4 |
| Geog 414 | Hydrology | 4 |
| Geog 415 | Soils and Land Use | 4 |
| Geog 442 | Sustainable Cities | 4 |
| Geog 445 | Resource Management Topics | 4 |
| Geog 446 | WaterResource Management | 4 |
| Geog 447 | Urban Streams | 4 |
| Geog 448 | The Urban Forest | 4 |
| Geog 449 | Geography ofFood | 4 |
| NAS 392 | Indigenous Ways of Knowing | 4 |
| USP 313U | Urban Environmental Issues | 4 |
| USP 434 | Green Buildings | 3 |
| USP 490 | Green Economics and | 3 |
|  | Sustainable Development |  |
| Interdisciplinary skills |  |  |
| Comm 327 | Environmental Campaigns | 4 |
| Comm 416 | Communicating Environmental | 4 |
|  | Controversies |  |
| Comm 445 | Risk and Strategic | 4 |
|  | Communication |  |
| Comm 448 | Science Communication | 4 |
| CR 313 | EnvironmentalConflict | 4 |
|  | Resolution |  |
| Ec 427 | Cost-Benefit Analysis | 4 |
| ELP 350U | Introduction to Leadership for | 4 |
|  | Sustainability |  |
| ESM 340 | Research Methods in | 4 |
|  | Environmental Science |  |
| ESM 451 | Project Management for | 4 |
|  | Scientists |  |
| Geog 420 | Field Methods in Physical | 4 |
|  | Geography |  |
| Geog 425 | Field Methods in Human | 4 |
|  | Geography |  |
| Geog 480 | Remote Sensing and Image | 4 |
|  | Analysis |  |
| Geog 484 | Cartographic Applications of | 4 |
|  | GIS |  |
| Geog | Geographic Information Systems | 4 |
| 488/USP | I : Introduction |  |
| 591 |  |  |
| Geog 490 | GIS Programming | 4 |


| Geog 496 | Introduction to Spatial <br> Quantitative Analysis | 4 |
| :--- | :--- | ---: |
| NAS 442 | Decolonizing Methodologies: | 4 |
|  | Insurgent Research and |  |
| Soc 396 | Indigenous Education <br> Social Research Methods, Social | 4 |
| Soc 397 | Statistics <br> Social Research Methods | 5 |
| SySc 342U | Systems Thinking for Social | 4 |
| SySc 413 | Change <br> Holistic Strategies for Problem | 4 |
| USP 316 | Solving <br> Community Organizing and | 4 |
| Wr 327 | SocialChange <br> Technical Report Writing | 4 |
| Total Credit Hours: 60-64 |  |  |

ENVIRONMENTAL
SCIENCE/ENVIRONMENTAL STUDIES HONORS TRACK

The Honors Track in Environmental Science or Environmental Studies will allow outstanding undergraduate students to obtain recognition for exceptional performance in coursework and research. Students will gain real life experience that will assist them when applying to graduate school and/or for a professional career position. Acceptance into the ESM Honors Track gives students an opportunity to work closely with a faculty mentor and the graduate students in his/her lab. In addition, participation in the Honor's Track strengthens the student's resume and provides themaccess to professional networking contacts.
This programis designed for upper division ESM majors who wish to deepen their knowledge base in a particular area of interest. Under the guidance of an assigned faculty adviser, participants willidentify a research project that will include readings, field or lab work, and a thes is. For additional information about the ESM Honors Track, please vis it the department website.

CLIMATE ADAPTATION AND MANAGEMENT CERTIFICATE

The department is currently not accepting applications to this certificate.

Over the coming decades, governments and the private sector around the world will spend billions of dollars to support adaptation measures that seek to reduce climaterelated vulnerabilities for people and theecosystems on which they depend. To contribute to climate risk management and adaptation at local to global levels students will need to understand the fundamentals of adaptation planning, assessing climate impacts, evaluating risk and vulnerability, identifying adaptation strategies, as well as monitoring climate impacts. Students who complete the certificate will be prepared to take active roles in and contribute to climate adaptation.

This is a rig orous certificate that will require a total of 21 credits in 300- and 400-level courses. The courses are split between science and management/policy courses. Although the certificate could be earned by any student, they will have to have had many pre-requisites (or equivalent preparation) in ESM or Geography.

## CERTIFICATE REQUIREMENTS

The certificate requires 21 credits of which 13 required credits are offered in ESM.

| Electives (choose 2) |  |
| :---: | :---: |
| G 459 | Quaternary Climate |
| ESM 428 | Urban Ecology |
| ESM 483 | Marine Conservation and |
|  | Management |
| ESM | Landscape Ecology |
| 418/Geog |  |
| 418 |  |
| ESM 427 | Watershed Biogeochemistry |
| ESM 480 | Coastal Marine Ecology |
| PS 435 | Dis asters and Public Policy |
| Geog | Climate and W ater Resources |
| 310U/Sci |  |
| 333 U |  |
| Geog 311U | Climatology |
| Geog | Climate Variability and Change |
| 312U/Sci |  |
| 334 U |  |

Subtotal: 8
Required courses
ESM 335 Introductionto Environmental 4 Management
ESM 462 Climate Change Impacts,
Adaptations and Responses:
Geosphere and Anthrosphere
ESM 464
Climate Adaptation: Managing
Environmental Risks and Vulnerabilities
ESM 407 Climate Change Adaptation SOE 1

Subtotal: 13
Students must take required courses for a differentiated grade and earn a C-or better for it to count toward the certificate (except that a $P$ is acceptable for the ESM 407 only).
Subtotal: 21
Total Credit Hours: 21

## FOREST ECOLOGY AND MANAGEMENT CERTIFICATE*

The department is currently not accepting applications to this certificate.

Forest managementrequires a consideration of the ecological, social, and policy context of Oregon's forests, including urban forests. This certificate is designed to provide the academic background required for understanding and managing forests beyond traditional industrial forestry needs. Students who complete the certificate will be prepared to take active roles in and contribute to management of Oregon's forests.

This is a rigorous certificate that will require eight 400level courses. The courses are split between forest ecology, watershed functioning, management, and policy areas. Although any student could earn the certificate, they will have to have had many pre-requis ites (or equivalent preparation) in ESM or Geography.

## CERTIFICATE REQUIREMENTS

| Electives |  |  |
| :--- | :--- | :--- |
| Bi 471 | Plant Ecology | 4 |
| Bi 476 | Population Ecology | 5 |
| ESM 427 | Watershed Biogeochemistry | 4 |
| ESM 435 | NaturalResource Policy and | 4 |
|  | Management |  |
| ESM 445 | Old-growth Forest Ecology | 4 |
| ESM 465 | Investigating Ecological and <br> Social Issues in Urban Parks and <br> Natural Areas | 4 |
| Geog 413 | Disturbance Biogeography of <br> Geog 415 | Pacific Northwest <br> Geog 448 |


|  | Subtotal: 16 |  |
| :---: | :---: | :---: |
| Core courses |  |  |
| ESM 407 | Forest Ecology and Management | 1 |
|  | Seminar |  |
| ESM | Landscape Ecology | 4 |
| 418/Geog |  |  |
| 418 |  |  |
| ESM 425 | W atershed Hydrology | 4 |

ESM $444 \quad$ Forest Ecology 4

## Subtotal: 13

Students must take required courses for a differentiated grade and earn a C-orbetter for it to count toward the certificate (except that a $P$ is acceptable for the ESM 407 only).
Total Credit Hours: 29

## LAKE AND RESERVOIR MANAGEMENT CERTIFICATE

PSU has a range of expertise in managing watersheds, lakes and reservoirs for ecological and water resources. PSU also has the Center for Lakes and Reservoirs that was established by the Oreg on State leg is lature to address lake management and invasive species is sues. Many of our faculty are active in the North AmericanLakes ManagementSociety (NALMS) and the local chapters of the Oreg on Lakes Association W ashing ton State Lake Protection Association.

This is a rigorous certificate that will require eight 400level courses. The courses are split between aquatic ecology, watershed processes, management, and policy areas. Although the certificate could be earned by any student, they will have to have had many pre-requisites (or equivalent preparation) in ESM or Geography. Students who complete the certificate will be prepared to take active roles in and contribute to management of lakes and reservoirs. In addition, this certificate is designed to provide the academic background required by the NALMS Professional Lake Manager certification program.

## CERTIFICATE REQUIREMENTS

The certificate requires 33 to 34 credits total and 22 of these credits must be in ESM. The student must complete courses in each of of the following five areas.

## Aquatic Ecology ( $\mathbf{1 0}$ credits)

## Required

ESM 475 Limnology and Aquatic Ecology 4
ESM 477 Limnology Laboratory 2
Choose one from the following:
ESM 424 Wetland Ecology
ESM 426 Ecology of Streams and Rivers 4
ESM 474 Fish Ecology and Conservation 4
WatershedScience (8 credits)
Required
ESM $425 \quad$ W atershed Hydrology
4
Choose one from the following:
ESM 427 Watershed Biogeochemistry
ESM Fate and Transport of Toxics in 4

| Geog 414 | Hydrology |  |
| :---: | :---: | :---: |
| Business and Management (8 credits) |  |  |
| Choose two from the following |  |  |
| ESM 483 | Marine Conservation and Management |  |
| ESM 485 | Ecology and Management of Bio-Invasions |  |
| Geog 446 | Water Resource Management |  |
| Geog 494 | GIS for Water Resources |  |
| Policy Legal and Governmental Aspects (7-8 credits) |  |  |
| Required |  |  |
| ESM 429 | Environmental Impact Assessment |  |
| Choose one from the following: |  |  |
| ESM 435 | Natural Resource Policy and Management |  |
| USP 571 | Environmental Policy |  |

Students must take required courses for a differentiated grade and earn a C-or better for it to count toward the certificate. Subtotal: 33-34
Total Credit Hours: 33-34

## CLIMATE CHANGE SCIENCE AND ADAPTATION MINOR

The Climate Change Science and Adaption Minor is a collaboration between the ESM and Geography departments. Full details regarding this undergraduate minor may be found on the Climate Change Science and Adaption Minor(p. 263) page.

## ENVIRONMENTAL SCIENCE MINOR

## REQUIREMENTS

To obtain a minor in environmental science, a student must complete at least 34 credits as listed below (at least 12 of which must be taken in residence at PSU). At least 4 credits each in biological sciences, physical sciences (physics, chemistry, geology), economics, and Mth 241 or Mth 251 are expected before admission to the minor.

## Courses

ESM 222
Applied Environmental Studies:
4 Policy Consideration
ESM 320
Environmental Systems I
4
ESM 321 Environmental Systems II 4
ESM 322 Environmental Risk Assessment 4
ESM 323 EnvironmentalSystems 2 Laboratory I
ESM 324

ESM 325

| Environmental RiskAssessment | 2 |
| :--- | :---: |
| Lab |  |
| Upper-division environmental | 4 |
| policy management courses |  |
| Upper-division environmental <br> sciences courses | 8 |

Subtotal: 34
Environmental policy/management courses (minimum 4 credits) include selected upper-division courses in environmentalscience and management, economics, and geography. Environmental sciencecourses (minimum 8 credits) include selected upper-divis ion courses in environmental science. A list of approved courses is available from the Environmental Science and Management office and the department website.
Courses taken under the undifferentiated grading option (pass/no pass) will not be accepted toward fulfilling minor requirements. Courses with omnibus numbers 401,404, 405,406 , and 407 are not allowed for the minor.
Additional courses may be required as prerequisites. Only grades of C - or above count toward satisfying the minor requirements.

## SUSTAINABILITY MINOR

This minor requires a multidisciplinary study of the environmental, social, and economic dimensions of sustainability

## REQUIREMENTS

To obtain a minor in sustainability a student must complete at least 30 credits (at least 15 of which must be taken in residence at PSU), to include the following:

## Courses

ESM $150 \quad$ Orientation to Environmental 1
UnSt 224 EnvironmentalSustainability 4
ESM 222 Applied Environmental Studies: 4
Policy Consideration Upper-division credits to include 15at least a total of four courses 16 from the following three categories
Students must choose at least one course fromeach category.
Economics and Business Issues

| Ec 332U | Economics of Environmental | 4 |
| :--- | :--- | ---: |
| Ec 444 | Issues | Economics of Green Power |
| Ec 433/ESM | Advanced Natural Resource | 4 |
| 433 | Economics | 4 |
| Ec 434/ESM | Business Environmental | 4 |
| 434 | Management Economics |  |


| Ec 443/ESM 443 | Global Environmental | 4 |
| :---: | :---: | :---: |
|  | Economics |  |
| USP 490 | Green Economics and | 3 |
|  | Sustainable Development |  |
| Ec 430 | Resource and Environmental | 4 |
|  | Economics |  |
| ESM 357U | Business Solutions for | 4 |
|  | Environmental Problems |  |
| Social and Management Issues |  |  |
| Arch 367U | Fundamentals of Environmental | 4 |
|  | Design |  |
| Geog 340U | Global Water Is sues and | 4 |
|  | Sustainability |  |
| Geog 345U | Resource Management | 4 |
| Geog 346U | World Population and Food | 4 |
|  | Supply |  |
| Geog 347U | Environmental Is sues and Action | 4 |
| Geog 442 | Sustainable Cities | 4 |
| Geog 465 | Tuscany: Sustainability in City and Country | 4 |
| Hst 339U | The Environment and History | 4 |
| Phl 310U | EnvironmentalEthics | 4 |
| PS 319U | Politics of the Environment | 4 |
| Sci 321U | Energy and Society I | 4 |
| Sci 322U | Energy and Society II | 4 |
| Soc 341U | Population Trends and Policy | 4 |
| Soc 465 | Environmental Sociology | 4 |
| SySc 334U | Modeling Social-Ecological Systems | 4 |
| USP 313U | Urban Environmental Issues | 4 |
| USP 325U | Community and the Built | 4 |
|  | Environment |  |
| USP | Population and Society | 4 |
| 419/Soc 441 |  |  |
| Environmental and Ecological Issues |  |  |
| ESM 355U | Understanding Environmental | 4 |
|  | Sustainability I |  |
| ESM 356U | Understanding Environmental | 4 |
|  | Sustainability II |  |
| ESM 420 | Ecological Toxicology | 4 |
| ESM 424 | Wetland Ecology | 4 |
| ESM 426 | Ecology of Streams and Rivers | 4 |
| ESM 428 | Urban Ecology | 4 |
| ESM 445 | Old-growth Forest Ecology | 4 |
| ESM | Air Quality | 4 |
| 460/CE 488 |  |  |
| Sci 335U | Water in the EnvironmentI | 4 |
| Sci 336U | Water in the Environment II | 4 |
| Sci 352U |  | 4 |
|  | Change |  |
| In addition, students must choose an appropriate capstone or internship: <br> UnSt 421 <br> Capstone |  |  |
|  |  |  |
|  |  | 6 |


| ESM 450 | Case Studies in Environmental <br> ProblemSolving | $4-6$ |
| :--- | :--- | ---: |
| ESM 404 | Cooperative Ed/Internship ESM | 6 |
|  | Sustainability Minor |  |

(A list of acceptable capstone and internship courses will be prepared for each year).
Subtotal: 30-31
Courses taken under the undifferentiated grading option (pass/no pass) will not be accepted toward fulfilling minor requirements. Courses with omnibus numbers 401,404, 405,406 , and 407 are not allowed for the minor. Additional courses may be required as prerequisites. Only grades of C- or above count toward satisfying the minor requirement.
NOTE: Students earning the minor in sustainability may not also earn the sustainable urban development minor offered by the Toulan School of Urban Studies and Planning unless the courses presented for the minors differ by at least 12 credits. Only grades of C- or above count toward satisfying the minor requirements.

## Graduate Programs

The Environmental Science and Management (ESM) graduate programprovides a curriculumthat will develop scientists and managers able to analyze and understand environmental systems, predict environmental change and participate in the management of the environment. Each student conducts research and completes a thesis or project; each student develops depth in a specific academic area; and each student develops breadth through a set of core courses that include concepts in physical systems, ecological systems and management. Areas of primary specialization are terrestrial, urban and aquatic ecology as they relate to human impacts and management. ESM offers the Masters of Science (MS), the Masters of Environmental Management (MEM), and the Professional Science Masters (PSM) degrees. The Departmentalso participates in the Earth, Environment, \& Society Ph.D. degree (p. 208).
The following procedures are designed to assure that the student is qualified to pursue both the programitself and a successful career in environmental science and management.

## ADMISSION REQUIREMENTS

## Master of Science, Master of Environmental Management, and Professional Science Masters

In addition to the instructions for admission to the univers ity graduate program, ESM master's programs require the following information fromeach applicant.

1. Satis factory scores on the Graduate Record Examination (GRE) aptitude test. A satisfactory score on the Test of English as a Foreign Language (TOEFL) is required for international students.
2. Three letters ofevaluation frompersons qualified to assess the applicant's promise as a graduate student.
3. Evidence of underg raduate or graduate coursework in biology, chemistry, statistics, physics, and mathematics (including differential and integral calculus) approximately equivalent to the foundation course requirements for underg raduate students in environmental scienceor environmental studies.
4. One official transcript fromevery college or university attended, including junior colleges and community colleges.
5. Statement of Interest.
6. Current resume or CV.
7. Identification of advisers.

Prospectivestudents should contact the programfor a statement of current admis sion policy. A high GPA and acceptable GRE scores do not guarantee admission to master's programs in Environmental Science and Management; admis sion is contingent on the availability of departmentresources and the identification of an appropriate adviser for each student.

## ENVIRONMENTAL SCIENCE AND

 MANAGEMENT M.E.M.University master's degree requirements must be met. In addition, specific degree programrequirements are listed in each program.
The graduate study programis developed through discussions involving the graduate student, thestudent's adviser, and the student's graduate committee. The M.E.M. graduate committee consists of at least three members including the major adviser. The major adviser and one other committee member must be a member of the graduate faculty. The graduate committee mustbe approved by the ESM Chair.
To encourage the development of interdis ciplinary graduate study programs, guidelines for course selection are flexible. M.E.M. students must complete at least 45 graduate credits.

## M.E.M. REQUIREMENTS

The M.E.M. program of study consists of the following minimum credit requirements:

| Courses | Core courses (one fromeach |  |
| :--- | :--- | ---: |
|  | core area and selected from <br> programlist and ESM 551) | 16 |
| ESM 507 | Speakers Series Seminar <br> repeated 3 times, 1 credit per <br> term | 3 |
|  | Quantitative analysis (selected <br> from programlist) | 4 |
|  | Area ofconcentration | 12 |
| ESM 509 | Elective and supporting courses | 4 |
| ESM 506 | Practicum | 1 |
| Subtotal:45 | Project | 5 |

## CORE COURSES

Core courses are required in physical environmental processes, ecological processes and environmental management for all master's students. M.E.M. students must also complete a core course in project management (ESM 551). Lists of approved corecourses are available from the ESM office or online at http://www.pdx.edu/esm.

## QUANTITATIVE ANALYSIS

A course in research methods, experimental design, or statistical analysis, is required to ensure students have sufficient skills for environmental research.

## ELECTIVE COURSES

Elective courses are to be defined in the student's program of study, and agreed upon by the student's adviser and graduate committee. Courses may be selected to provide additional background, to explore new are as, and to add depth to a scholastic program.

## THESIS OR PROJECT

A central purpose of the M.E.M. degree is to teach students the process of problemsolving and research. A minimum of 6 credits is required. Students working toward the M.E.M. degree will be required to complete a project in lieu of a thes is. M.E.M. students will take: 1 unit of ESM 509 Practicumat the beginning of their program, and 5 units of ESM 506. This project is expected to be the product of original work in cooperation with an agency, org anization, or firm involved in environmental management activities. The project plan, approach, and project report mustbe approved by the advisory committee in a manner parallel to that for thesis research. The project report must be presented at a public seminar to be followed by an oral defenseof the work conducted by the student's graduate committee.

University master's degree requirements must be met. In addition, specific degree programrequirements are listed in each program.
The graduate study programis developed through discussions involving the graduate student, thestudent's adviser, and the student's graduate committee. The M.S. graduate committee consists of at least three members including the major adviser. The major adviser and one other committee member must be a member of the graduate faculty. The graduate committee mustbe approved by the ESM Chair.
To encourage the development of interdisciplinary graduate study programs, guidelines for course selection are flexible. M.S. students must complete at least 46 graduate credits.

## M.S. REQUIREMENTS

The M.S. programof study consists of the following minimum credit requirements:

## Courses

|  | Core courses (one fromeach <br> core area and selected from <br> programlist) | 16 |
| :--- | :--- | ---: |
| ESM 507 | Speakers Series Seminar <br> repeated 3 times, 1 credit per <br> term | 3 |
| ESM 509 | Practicum |  |
|  | Quantitative analy sis (selected | 1 |
|  | from programlist) |  |
|  | Area of concentration | 12 |
| ESM 503 | Elective and supporting courses | 4 |
| Thesis | $6-12$ |  |

Subtotal: 46

## CORE COURSES

Core courses are required in physical environmental processes, ecological processes and environmental management for all master's students. Lists of approved core courses are available from the ESM office or online at http://www.pdx.edu/esm.

## QUANTITATIVE ANALYSIS

A course in research methods, experimentaldesign, or statistical analysis, is required to ensure students have sufficient skills for environmental research.

## ELECTIVE COURSES

Elective courses are to be defined in the student's program of study, and agreed upon by the student's adviser and graduate committee. Courses may be selected to provide additional background, to explore new areas, and to add depth to a scholastic program.

## THESIS OR PROJECT

A central purpose of the M.S. degree is to teach students the process of problemsolving and research. A minimum of 6 credits is required. Students working toward the M.S. degree will be required to complete original research leading to a thesis, which complies with standards established by the Graduate School.

## ENVIRONMENTAL SCIENCE AND MANAGEMENT P.S.M.

University master's degree requirements must be met. In addition, specific degree programrequirements are listed in each program.

The graduate study program is developed through discussions involving the graduate student, thestudent's adviser, and the student's graduate committee. The P.S.M. graduate committee consists of at least three members including the major adviser. The major adviser and one other committee member must be a member of the graduate faculty. The graduate committee must be approved by the ESM Chair.
To encourage the development of interdis ciplinary graduate study programs, guidelines for course selection are flexible. P.S.M. students must complete at least 47 graduate credits.

## P.S.M. REQUIREMENTS

The P.S.M. program of study consists of the following minimum credit requirements.
Courses

|  | Core courses (one fromeach <br> core area and selected from <br> programlist and ESM 551) | 16 |
| :--- | :--- | ---: |
| ESM 507 | Speakers Series Seminar <br> repeated 3 times, 1 credit per <br> term | 3 |
|  | Quantitative analysis (selected | 4 |
|  | from programlist) |  |
| ESM 509 | Area ofconcentration | 8 |
| ESM 506 | Practicum | 1 |
|  | Project | 5 |
|  | PSM "Plus " Courses | 10 |

Subtotal: 47

## CORE COURSES

Core courses are required in physical environmental processes, ecological processes and environmental management for all master's students. P.S.M. students must also complete a core course in project management (ESM 551). Lists of approved core courses are available from the ESM office or online at http://www.pdx.edu/esm.

## QUANTITATIVE ANALYSIS

A course in research methods, experimentaldesign, or statistical analysis, is required to ensure students have sufficient skills for environmental research.

## ELECTIVE COURSES

Elective courses are to be defined in the student's program of study, and agreed upon by the student's adviser and graduate committee. Courses may be selected to provide additional background, to explore new areas, and to add depth to a scholastic program.

## THESIS OR PROJECT

The culminating experience of the students seeking a P.S.M. degree is the completion of a project. This element of the curriculumserves to integrate coursework, further develop skills required to function effectively in a profes sional setting (e.g., communication, presentation, and project management) and provide an opportunity to participate in the solution of a real environmental problem. Working with local agencies or/and organizations, an ESM faculty member and possibly in a group of other students, the P.S.M. student identifies a problem, formulates a project with the community partner, formally proposes a project, completes the scope of work detailed in the proposal, and documents and presents the results of the project to an appropriate audience. This project is ESM 506 - Project, 5 credits.

## P.S.M. PLUS COURSES

In addition to the above courses, the P.S.M. degree also requires at least four courses ( 10 credits) focused on bus inessand professional management and practices. These "Plus Courses" are what distinguish the P.S.M. degree fromthe M.E.M. degree. The student is required to complete at least two credits in each of the four areas of "Plus Courses" (communication, law/policy, analytical tools, and ethics). Lists of approved "Plus Courses" are available from the ESM office or online at
http://www.pdx.edu/esm.

## HYDROLOGY GRADUATE CERTIFICATE

The Graduate Certificate of Hydrology is designed to give students advanced training in hydrology, and leads to profes sional certification with the American Institute of Hydrology (AIH).

## Surface Hydrology Core

Take one of the following:

| CE | Watershed Hydrology | 4 |
| :---: | :---: | :---: |
| 565/ESM |  |  |
| 525 |  |  |
| G 566 | Glaciology | 4 |
| Geog 514 | Hydrology | 4 |
|  | Subtotal: 4 |  |
| Hydrogeology Core |  |  |
| Take one of the following: |  |  |
| CE 569 | Subsurface Hydrology | 4 |
| ESM | Fate and Transport of Toxics in | 4 |
| 579/CE 579 | the Environment |  |
| G 543 | Ground Water Geology | 4 |
| G 545 | Geochemistry | 4 |
| Subtotal: 4 |  |  |
| Water Quality Core |  |  |
| Take one of the following: |  |  |
| CE 578 | Water Quality Modeling | 4 |
| ESM 527 | Watershed Biogeochemistry | 4 |
| ESM 575 | Limnology and Aquatic Ecology | 4 |
| ESM | Fate and Transport of Toxics in | 4 |
| 579/CE 579 | the Environment |  |
| G 545 | Geochemistry | 4 |
| G 548 | Chemical Hydrogeology | 4 |

Subtotal: 4

## Category I Elective

Take one of the following:

| CE 561 | WaterResourceSystems | 4 |
| :--- | :--- | :--- |
| CE | Analysis |  |
| 565/ESM | Watershed Hydrology | 4 |
| 525 |  |  |
| CE | Environmental Data Analysis | 4 |
| 566/ESM |  |  |
| 566 |  | 4 |
| CE 569 | Subsurface Hy drology | 4 |
| CE 572 | EnvironmentalFluid Mechanical | 4 |
|  | Transport |  |
| CE 576 | EnvironmentalFluid Mechanics | 4 |
| CE 578 | WaterQuality Modeling | 4 |
| CE 581 | The Columbia River as a System | 2 |
| CE 587/Ch | Aquatic Chemistry | 4 |
| 587 |  |  |
| CE 590 | Soil and Groundwater | 4 |
|  | Restoration |  |
| ESM 520 | Ecological Toxicology | 4 |
| ESM 524 | Wetland Ecology | 4 |
| ESM 526 | Ecology of Streams and Rivers | 4 |
| ESM 527 | Watershed Biogeochemistry | 4 |
| ESM 575 | Limnology and Aquatic Ecology | 4 |
| ESM 577 | Limnology Laboratory | 2 |
| ESM | Fate and Transport of Toxics in | 4 |
| 579/CE 579 | the Environment |  |


| G 543 | Ground W ater Geology | 4 |
| :---: | :---: | :---: |
| G 544 | Well Dynamics | 4 |
| G 545 | Geochemistry | 4 |
| G 548 | Chemical Hydrogeology | 4 |
| G 566 | Glaciology | 4 |
| Geog 514 | Hydrology | 4 |
| Geog 547 | Urban Streams | 4 |
| Geog 594 | GIS for Water Resources | 4 |
| Ph 526 | Thermodynamics and Statistical Mechanics | 4 |
| Subtotal: 4 |  |  |
| Category II Elective |  |  |
| Take two of the following: |  |  |
| Bi 523 | Microbial Ecology | 4 |
| CE 561 | Water ResourceSystems | 4 |
|  | Analysis |  |
| CE | W atershed Hydrology | 4 |
| 565/ESM |  |  |
| CE | EnvironmentalData Analysis | 4 |
| 566/ESM |  |  |
| 566 |  |  |
| CE 569 | Subsurface Hydrology | 4 |
| CE 572 | EnvironmentalFluid Mechanical Transport | 4 |
| CE 573 | Numerical Methods in | 4 |
|  | Environmental and Water |  |
|  | Resources Engineering |  |
| CE 574 | Unit Operations of | 4 |
|  | Environmental Engineering |  |
| CE 576 | EnvironmentalFluid Mechanics | 4 |
| CE 578 | WaterQuality Modeling | 4 |
| CE 581 | The Columbia River as a System | 2 |
| CE 582 | Introduction to Sediment | 4 |
|  | Transport |  |
| CE 583 | Estuarine Circulation | 4 |
| CE 587/Ch | Aquatic Chemistry | 4 |
| 587 |  |  |
| CE 590 | Soil and Groundwater | 4 |
|  | Restoration |  |
| ESM 563 | Water Quality Policy \& | 4 |
|  | Management |  |
| ESM 567 | Multivariate Analysis of | 4 |
|  | EnvironmentalData |  |
| ESM 571/Ph | Atmospheric Physics | 4 |
| 571 |  |  |
| ESM 573 | PhytoplanktonEcology | 4 |
| ESM 575 | Limnology and Aquatic Ecology | 4 |
| ESM 577 | Limnology Laboratory | 2 |
| ESM | Fate and Transport of Toxics in | 4 |
| 579/CE 579 | the Environment |  |
| ESM 580 | Coastal Marine Ecology | 4 |
| ESM 583 | Marine Conservation and Management | 4 |


| G 520 | Applied Geophysics | 4 |
| :---: | :---: | :---: |
| G 523 | Statistics and Data Analysis in the Geosciences | 4 |
| G 524 | Geographical Information Systems for the NaturalSciences | 4 |
| G 543 | Ground Water Geology | 4 |
| G 544 | Well Dynamics | 4 |
| G 545 | Geochemistry | 4 |
| G 547 | EnvironmentalSediment Transport | 4 |
| G 548 | Chemical Hydrogeology | 4 |
| G 561 | Environmental Geology | 4 |
| G 566 | Glaciology | 4 |
| G 570 | Engineering Geology | 4 |
| Geog 512 | Global Climate Change Science and Socio-environmental Impact Assessment | 4 |
| Geog 514 | Hydrology | 4 |
| Geog 546 | WaterResource Management | 4 |
| Geog 547 | Urban Streams | 4 |
| Geog 580 | Remote Sensing and Image Analysis | 4 |
| Geog 581 | Digital Image Analys is I: Introduction | 4 |
| Geog | Geographic Information Systems | 4 |
| $\begin{aligned} & \text { 588/USP } \\ & 591 \end{aligned}$ | I: Introduction |  |
| Geog 594 | GIS for Water Resources | 4 |
| Geog 597 | Advanced SpatialQuantitative Analysis | 4 |

## Total Credit Hours: 24

## Geography

424 Cramer Hall
503-725-3916
www.pdx.edu/geography

- B.A., B.S. in Geography
- B.A., B.S. in Environmental Studies
- Minor in Geography
- Minor in GIS
- Minor in Water Resources
- Minor in Climate Change Science and Adaptation
- Secondary Education Program-SocialScience
- M.A., M.S. in Geography
- M.S.in GIS
- M.A.T. and M.S.T. (General Social Science)
- Graduate Certificate in GIS
- Ph.D. in Earth, Environment, \& Society


## Undergraduate programs

The Geography Department at Portland State University links environmental studies and cultural studies in a programcentered on environmental is sues, social and cultural lands capes, sustainability in urban and natural areas, and Geographic Information Science. Coursework emphasizes systematic and regional approaches to understanding the physical environment and humanenvironment interactions. Techniques classes (in GIS, remote sensing, cartography, and spatial analysis ) provide the tools to analyze complexlocal, regional, and global phenomena. Access to the Pacific Coast and the Cascade Mountains provides ample opportunity for fieldwork-based classes and opportunities for research. The PSU Department of Geography is an excellent choice for undergraduate and graduate students with interests in the linkages between human and natural sy stems.

Faculty eng age in local, regional, and international research projects in hydrology, water resources, biogeography, geomorphology, sustainable development, land use analysis, climate change, cultural and political ecology, cultural landscapes, the urban environment, geographic education, and geographic information science. Ongoing faculty research sites in international areas include Patagonia, the Amazon Basin, Sub-saharan Africa, South Asia, and the Pacific Rim.

Geography participates in the Earth, Environment and Society (EES) Ph.D. Program. Over 120 undergraduate majors and 30 graduate students participate in two departmental groups, the Friends of Geography and the Student Chapter of the American Society for Photogrammetry and Remote Sensing/Columbia River Region. Several research groups and outreach programs in the department provide additional job and internship opportunities for interested students in public agencies and businesses in such fields as planning, environmental management, GIS, and cartography.
The geography program gives students an appreciation and understanding of the human environmenton global, regional, and local scales. It provides background and requisite training for careers in resource, planning, environmental, or education fields. Geography majors find work in urban and natural res ource management, spatial/GIS analysis, urban planning, map design and production, and statistical analysis. Geography is the lead department on campus for training in GIS, remote sensing, cartography, and spatial analysis.

DEGREE MAPS AND LEARNING OUTCOMES
To view the degree maps and expected learning outcomes for Geography's undergraduate degrees, go to
www.pdx.edu/academic-programs/a-z.

## ADMISSION REQUIREMENTS

Admission to the department is based on general admission to the University. See Admis sions Requirements (p. 8) for more information.

GEOGRAPHY B.A./B.S.
In addition to meeting the general University degree requirements, the major in geography must complete at least 52 credits in geography courses, including 12 credits in each of the following areas: geographic techniques, physical geography, and human geography - as detailed below. Of the courses presented for the major, 12 credits are in required courses (Geog 210, Geog 230, and Geog 380 U ), and at least 36 Geography credit hours must be at the upper division, to include 16 hours at the 400 -level. Geog 496, or Stat 243 and Stat 244, or equivalent is required for the B.S. degree.

## REQUIREMENTS

| Physical Geography: (12 credits) |  |  |
| :---: | :---: | :---: |
| Geog 210 | PhysicalGeography | 4 |
| Geog | Climate and W ater Resources | 4 |
| 310U/Sci |  |  |
| 333 U |  |  |
| Geog 311U | Climatology | 4 |
| Geog | Climate Variability and Change | 4 |
| 312U/Sci |  |  |
| 334 U |  |  |
| Geog 313U | Biogeography | 4 |
| Geog 314U | Severe Weather | 4 |
| Geog 320/G | Geomorphic Processes | 4 |
| 374 |  |  |
| Geog 322U | Alpine Environments | 4 |
| Geog | Weather | 4 |
| 333U/Ph |  |  |
| 333 U |  |  |
| Geog 340U | Global Water Is sues and | 4 |
|  | Sustainability |  |
| Geog 407 | Seminar in PhysicalGeography | 4 |
| Geog 412 | Global Climate Change Science and Socio-en vironmental Impact | 4 |
|  | Assessment |  |
| Geog 413 | Disturbance Biogeography of Pacific Northwest | 4 |
| Geog 414 | Hydrology | 4 |
| Geog 415 | Soils and Land Use | 4 |
| Geog | Landscape Ecology | 4 |
| 418/ESM |  |  |
| 418 |  |  |
| Geog | The Ecology \& Management of | 4 |
| 440/ESM | Wildfire |  |
| 440 |  |  |

Geog 210: required

| Human Geography: (12 credits) |  |  |
| :---: | :---: | :---: |
| Geog 230 | Environment and Society: Global Perspectives | 4 |
| Geog 321 | Mt. Hood | 4 |
| Geog 331U | Geography of Globalization | 4 |
| Geog 332U | Urban Geography | 4 |
| Geog 345U | Resource Management | 4 |
| Geog 346U | World Population and Food Supply | 4 |
| Geog 347U | Environmental Is sues and Action | 4 |
| Geog 348U | Cultural and PoliticalEcology | 4 |
| Geog 349U | Mountain Geography | 4 |
| Geog 350U | Geography of W orld Affairs | 4 |
| Geog 351U | Pacific Northwest | 4 |
| Geog 352U | The Himalaya and Tibet | 4 |
| Geog 353U | Pacific Rim | 4 |
| Geog 354U | Europe | 4 |
| Geog 360U | Latin America | 4 |
| Geog 363U | Geography of sub-Saharan | 4 |
|  | Africa |  |
| Geog 364U | The Middle East | 4 |
| Geog 366U | Historical Geography of North America | 4 |
| Geog 368U | United States and Canada | 4 |
| Geog 375U | Maps, Culture and Society | 4 |
| Geog 407 | Seminar in Human Geography | 4 |
| Geog 430 | Cultural Geography | 4 |
| Geog 432 | Urban Landscapes | 4 |
| Geog 442 | Sustainable Cities | 4 |
| Geog 445 | Resource Management Topics | 4 |
| Geog 446 | Water ResourceManagement | 4 |
| Geog 447 | Urban Streams | 4 |
| Geog 448 | The Urban Forest | 4 |
| Geog 462 | Sense of Place | 4 |
| Geog 465 | Tuscany: Sustainability in City and Country | 4 |
| Geog 467 | Community Resilience in | 4 |
|  | Coupled Socio-Ecological |  |
|  | Systems |  |
| Geog 472 | Critical GIS | 2 |
| Geog 230: required |  |  |
| Geographic Techniques: (12 credits) |  |  |
| Geog 380U | Maps and Geographic | 4 |
|  | Information |  |
| Geog 407 | Seminar in Research Skills | 4 |
| Geog 420 | Field Methods in Physical | 4 |
|  | Geography |  |
| Geog 425 | Field Methods in Human | 4 |
|  | Geography |  |
| Geog 472 | Critical GIS | 2 |
| Geog 475 | Digital Compilation and | 4 |
|  | Database Design |  |
| Geog 476 | 3D Terrain Analysis \& | 2 |
|  | Visualization |  |


| Geog 477 | Photogrammetry andLiDAR | 2 |
| :---: | :---: | :---: |
| Geog 480 | Remote Sensing and Image | 4 |
|  | Analysis |  |
| Geog 481 | Digital Image Analysis I: | 4 |
|  | Introduction |  |
| Geog 482 | Digital Image Analys is II: | 4 |
|  | Advanced Remote Sensing |  |
| Geog 484 | Cartographic Applications of | 4 |
|  | GIS |  |
| Geog 485 | Map Design and Production | 4 |
| Geog | Geographic Information Systems | 4 |
| 488/USP | I: Introduction |  |
| 591 |  |  |
| $\text { Geog } 489$ | Building a GIS Database with | 4 |
|  | GPS |  |
| Geog 490 | GIS Programming | 4 |
| Geog | Geographic Information Systems | 4 |
| 492/USP | II: Advanced GIS |  |
| 592 |  |  |
| Geog 494 | GIS for Water Resources | 4 |
| Geog 495 | Maps, Models, and GIS | 4 |
| Geog 496 | Introductionto Spatial | 4 |
|  | Quantitative Analysis |  |
| Geog 497 | Advanced SpatialQuantitative | 4 |
|  | Analysis |  |

Geog 380U: required

## Geography Electives (16)

Subtotal: 52
Course taken under the undifferentiated grading option (pass/no pass) will not be accepted toward fulfilling department major requirements.

All courses used to satis fy the departmental major requirements must be graded C - or above.

## B.A., B.S. IN ENVIRONMENTAL STUDIES

The B.A, B.S. in EnvironmentalStudies is a collaboration between the Geography and Environmental Scienceand Management departments. Full details regarding this degree may be found on theB.A., B.S. in Environmental Studies page (p. 249).

## GEOGRAPHY MINOR

To earn a minor in geography a student must completea minimum of 28 credits in geography (at least 12 credits of which must be taken in residence at Portland State University, and 16 credits of which must be upperdivision), to include the following:

## REQUIREMENTS

## Courses

Geog 210 Physical Geography
4

| Geog 230 | Environment and Society: <br> Global Perspectives | 4 |
| :--- | :--- | ---: |
| Geog 380U | Maps and Geographic | 4 |
|  | Information <br> Geography electives (upper- <br> division) | 16 |
| Subtotal:28 | la |  |

Subtotal: 28
All courses used to satisfy the departmental minor requirements must be graded C - or above.

## WATER RESOURCES MINOR

The minor may be earned simultaneously with a B.A. or B.S. degree, or post baccalaureate in any major.

## REQUIREMENTS

| Adviser-approved courses (16 credits) |  |  |
| :--- | :--- | :--- |
| Students must take at least one 300-level course and two |  |  |
| 400-level courses fromthese current offerings. |  |  |
| Geog |  |  |
| 310U/Sci | Climate and W ater Resources | 4 |
| 333U |  |  |
| Geog 320/G | Geomorphic Proces ses | 4 |
| 374 |  |  |
| Sci 335U | Waterin the EnvironmentI | 4 |
| ESM 424 | Wetland Ecology | 4 |
| ESM 425 | Watershed Hydrology | 4 |
| ESM 426 | Ecology of Streams and Rivers | 4 |
| ESM 475 | Limnology and Aquatic Ecology | 4 |
| G 443 | Ground Water Geology | 4 |
| G 448 | Chemical Hydrogeology | 4 |
| Geog 414 | Hydrology | 4 |
| Geog 446 | Water ResourceManagement | 4 |
| Geog 447 | Urban Streams |  |
| Geog 494 | GIS for Water Resources | 4 |

Students may use up to four credits of other coursework toward minor requirements.

For students pursuing both the Geography major and the Water Resources Minor OR both the Environmental Science major and the Water Resources minor ORboth the Environmental Studies major and the Water Resources minor, courses presented for the minor must differ from the major by at least 12 credits.

## Foundational Courses ( $\mathbf{1 2}$ credits)

Students must choose three of the foundational courses from the following Geography and Environmental Sciences and Management courses.
Geog 210 Physical Geography
Geog 230 Environment and Society: Global

## Perspectives

Geog 340U Global Water Issues and Sustainability

Introduction to Environmental Systems

GEOGRAPHIC INFORMATION SYSTEMS MINOR

## REQUIREMENTS

To earn a minor in GIS (Geographic Information Systems) a student mustcomplete a minimum of 28 credits in geography (at least 16 credits must be taken in residence at Portland State University), to include the following:

| Core courses: |  |  |
| :--- | :--- | :--- |
| Geog 210 | $(\mathbf{1 6}$ credits $)$ | 4 |
| PhysicalGeography |  |  |
| Geog 230 | or <br> Environment and Society: <br> Global Perspectives | 4 |
| Geog 380U | Maps and Geographic | 4 |
| Geog | Information <br> Geographic Information Systems | 4 |
| 488/USP | I: Introduction |  |
| 591 | Geographic Information Systems | 4 |
| Geog |  |  |
| 492/USP | II: Advanced GIS |  |
| 592 |  |  |

Plus additional courses from the list of electives totaling 12 credits:
Geog $472 \quad 2$
Geog 475 Digital Compilation and 4
Geog $476 \quad$ 3D Terrain Analys is \& 2
Geog 477 Photogrammetry andLiDAR 2
Geog 480 Remote Sensing and Image 4
Geog $481 \quad$ Digital Image Analys is I: 4
Geog 482 Digital Image Analys is II: 4
Geog 484 Cartographic Applications of 4
Geog $485 \quad$ Map Design and Production 4
Geog $489 \quad$ Building a GIS Database with 4
Geog $490 \quad$ GIS Programming 4
Geog $494 \quad$ GIS for W ater Res ources 4
Geog 495 Maps, Models, and GIS 4
Geog 496 Introductionto Spatial 4
Quantitative Analysis
Advanced SpatialQuantitative 4
Analysis

## Core courses: ( $\mathbf{1 6}$ credits)

- 

Geog 497

4

## g

All courses submitted to satisfy requirements for the minor in GIS must be graded and passed with a C - or better. At least 16 credits must betaken in residence at PSU. Subtotal: 28

Students who are also working toward the major in Geography must take (in addition to the core courses for the GIS minor) at least 12 credits fromthe list of electives that will be uniquely applied to the GIS minor.
Students considering the GIS minor are strongly encouraged to meet with a geography adviser to work out an instructional programthat best meets their needs.

## CLIMATE CHANGE SCIENCE AND ADAPTATION MINOR

Students will need to complete at least 27 credits to complete the Climate Change Science and Adaptation Minor. The minor may be earned simultaneously with a BA or BS degree or post baccalaureate in any major. Students can choose among a range of core and elective courses fromthe social and physical sciences. For students pursuing both the Geography major and the Climate Change Science and Adaptation Min or OR both the EnvironmentalScience(orStudies) and the Climate Change Science and Adaptation Minor, courses presented for the minor must differ from the major by at least 12 credits.

## CORE COURSES

Pick five from the following core courses, at least 2 courses must be 400 -level:

| Geog | Climate and W ater Resources | 4 |
| :--- | :--- | ---: |
| 310U/Sci |  |  |
| 333U |  | 4 |
| Geog 311U | Climatology | 4 |
| Geog | Climate Variability and Change | 4 |
| 312U/Sci |  | 4 |
| 334U 314U | Severe Weather |  |
| Geog 375U | Climate Change and Human Life | 4 |
| Geog 412 | Global Climate Change Science | 4 |
|  | and Socio-environmental Impact |  |
| ESM 464 | Assessment <br>  <br> Climate Adaptation:Managing 4 <br>  Vnvironmental Risks and | 4 |

Subtotal: 20

## ELECTIVES

## Management and Policy Track

At least one course selected needs to be at the 400-level:

| Geog | Climate and W ater Resources | 4 |
| :--- | :--- | ---: |
| 310U/Sci |  |  |
| 333U |  |  |
| Phl 310U | Environmental Ethics | 4 |
| USP 313U | Urban Environmental Issues | 4 |
| Ec 332U | Economics of Environmental | 4 |
| ESM 335 | Issues |  |
|  | Introductionto Environmental | 4 |
| Geog 340U | Management | Global Water Is sues and |
| Geog 345U | Sustainability | Resource Management |

## Subtotal: 7-8

## Physical Science Track

At least one course selected needs to be at the 400-level:
Geog 311U Climatology 4
Geog 314U Severe Weather 4
Geog Weather 4
333U/Ph
333U
SySc 330U Models in Science 4
Ph 375U Climate Change andHuman Life 4
Geog 412 Global Climate Change Science 4 and Socio-environmental Impact Assessment
Geog 413 Disturbance Biogeography of 4
Geog 414 Hydrology 4

| Geog | Landscape Ecology | 4 |
| :--- | :--- | :--- |
| 418/ESM |  |  |
| 418 |  | 4 |
| ESM 425 | Watershed Hydrology | 4 |
| ESM 427 | Watershed Biogeochemistry | 4 |
| ESM 471/Ph | Atmospheric Physics | 4 |
| 471 |  | 4 |
| ESM | Air Quality | 4 |
| 460/CE 488 | Introductionto Advanced | 4 |
| CE 489 | EnvironmentalFluid Mechanics |  |

Subtotal: 8
Total Credit Hours: 27-28
GEOGRAPHY SECONDARY EDUCATION PROGRAM

## Adviser: See CLAS Advising

(See Interdisciplinary Studies (p. 288))

## Graduate programs

The Department of Geography offers the degrees of Master of Arts, Master of Science, Master of Arts in Teaching, and Master of Science in Teaching (General Social Science). The department alsoparticipates in the Earth, Environment, \& Society Ph.D. degree.

Areas of primary concentration are urban geography, physical geography, resource management, culture, environment and society, GIS, and cartography. The M.A. and M.S. degrees are in part designed to meet the needs of students preparing for careers in research or administration in government and industry, urban and regional planning, and in secondary education and community college teaching. The M.A. and M.S. degrees also provide a predoctoral programin geography for students planning to take advanced work leading to professional careers in university teaching, research, or public service. Students are encouraged to follow a programthat combines breadth of knowledge with depth in one field of interest.

## ADMISSION REQUIREMENTS

For admission to graduatestudy for the M.A. and M.S. degrees, a student normally should have completed the minimum preparation for an undergraduate major in geography with a 3.00 grade point average in all work. Students with majors in other fields are encouraged to apply. Normally such students are admitted on a conditional basis, with the student required to take courses to remedy deficiencies.

In addition to the general University admis sion requirements for advanced degrees the studentmust
provide letters of recommendation fromthree faculty members of colleges previously attended.

Students for whomEnglish is a second language must present a score of at least 550 (paper-based) or 213 (computer-based) in the Testof English as a Foreign Language (TOEFL) with their application for admis sion.

## GEOGRAPHIC INFORMATION SYSTEMS GRADUATE CERTIFICATE

Certificate requirements: Successful completion of 20 specified graduatecredits with a cumulative PSU graduate GPA of 3.0 or higher (all graduate credit taken at PSU) and a cumulative programGPA of 3.0 or higher (all courses used for the Graduate Certificate), dis tributed as follows: 8 credits of core courses and 12 credits of electives. All certificate requirements must be fulfilled within three calendaryears of admis sion. Courses taken three years before the programcompletion datecannot be used to fulfill the programrequirements All certificate program courses must be taken for a letter grade (A-F). The programprerequisite, GEOG 380 (Maps and Geographic Information), cannot be used toward the certificate requirements.

## REQUIRED CORE COURSES

| Courses <br> Geog | Geographic Information Systems | 4 |
| :--- | :--- | :---: |
| 588/USP | I: Introduction |  |
| 591 |  |  |
|  | And | 0 |
| Geog 588L | GIS Lab |  |
|  |  | 4 |
| Geog | Geographic Information Systems | 4 |
| 592/USP | II: Advanced GIS |  |
| 592 |  |  |
| Geog 592L | And II Lab | 0 |

A student may requesta waiver of these courses from the programdirector on the basis of prior educational background under the following circumstances:

1. The student has taken the course at the undergraduate level or taken themas part of an undergraduate programat PSU.
2. If GIS I and GIS II equivalent were taken at another institution, syllabi fromthosecourses must be submitted as part of the waiver request.
Waivers are at the discretion of the programdirector. If the waiver is not approved, a student must take GIS I and GIS II. If the waiver is approved a student must take additional credits from the following list to fulfill the required 8 credits of core curriculum:
Geog 575 Digital Compilation and Database Design (4)

Geog 581 Digital Image Analys is I: Introduction (4)
Geog 584 Cartographic Applications of GIS (4)
Geog 597 SpatialQuantitative Analysis (4)
Subtotal: 8

## ELECTIVES

12 credits fromthis list or similar discrete-numbered courses approved in adv ance by the director.

| Courses |  |  |
| :---: | :---: | :---: |
| G 525 | Field GIS | 4 |
| Geog 572 | Critical GIS | 2 |
| Geog 575 | Digital Compilation and Database Design | 4 |
| Geog 576 | 3D Terrain Analys is \& Visualization | 2 |
| Geog 577 | Photogrammetry and LiDAR | 2 |
| Geog 580 | Remote Sensing and Image Analysis | 4 |
| Geog 581 | Digital Image Analysis I: Introduction | 4 |
| Geog 582 | Digital Image Analysis II: Advanced Remote Sensing | 4 |
| Geog 584 | Cartographic Applications of GIS | 4 |
| Geog 585 | Map Design and Production | 4 |
| Geog 589 | Building a GIS Database with GPS | 4 |
| Geog 590 | GIS Programming | 4 |
| Geog 591 | Profes sionalis min GIS | 2 |
| Geog 594 | GIS for Water Resources | 4 |
| Geog 595 | Maps, Models, and GIS | 4 |
| Geog 597 | Advanced Spatial Quantitative Analysis | 4 |
| USP 543 | Geographic Applications to Planning | 4 |
| USP 593 <br> Subtotal: 12 | Public Participation GIS | 3 |

Total Credit Hours: 20

## Program Completion Application

Application for award of the GraduateCertificate must be filed by the studentin the Graduate School no later than the first week of the anticipated termof graduation (deadlines for each termare av ailable at the Graduate School).

## Transfer Credits

Transfer credit is defined as eligible graduate cred it taken at other accredited institutions. Two-thirds of the Graduate Certificate programrequirements or 15 credits minimum,
whichever is larger, must be taken at Portland State University. Transfer credits mustbe letter-graded with a B or higher and eligible for use in master's degree programs at PSU. The Proposed TransferCredit form(GO-11GC) must be used for approval of trans fercredit.

## Experimental 510 Courses

Due to the fast developments in geospatial technologies, some experimental cours es can be used toward the Certificate with the approval of the ProgramDirector. Please verify the eligibility with the instructor or Geography department before taking a 510 course to fulfill the Certificate requirements. Each student can have a maximum of one 510 course per program. The experimental course can only be used as a substitute for an elective, not a core course. Joint campus courses (JC 510) are cons idered transfer credits for which all transfer credit limitations apply.

## Course Overlap between Degrees and Certificates

Graduate GIS Certificate courses can be applied to a master's (or a doctoral) degree or another graduate certificate that accepts the courses as electives.

## GEOGRAPHIC INFORMATION SCIENCE M.S.

Students will plan a programof study with an adviser and other members of the supervisory committee during the first term of residence (the first termafter admission to the program). The programof study must include a minimum of 45 graduate credits. Of these, a minimum of 32 graduate credits must be in geography, to include 6 credits of Geog 509 (GIS Practicum), 12 credits of core geography courses, 8 credits in core GIS competency courses, 4 credits in nonGIS, topical courses, at least two courses (6-8 credits) from one of the five specialized geospatial data science focus areas, and $7-9$ elective credits to meet the 45 credits required by the program.
Students in the programmust complete a project-based practicum. The practicumrequires the presentation of the student's practicumproject into a topic approved by the student's graduate committee, which may include a community partner. The practicumrepresents an original contribution to knowledge in the field of GIScience and normally involves working with a community partner. A final oral presentation of the project and a project report are required for completion of the degree.
The Geography Department follows the University requirement for minimum and continuous enrollment.

The program consists of coursework in the following areas:

| Core Geography Courses |  |  |
| :---: | :---: | :---: |
| Geog 572 | Critical GIS | 2 |
| Geog 591 | Professionalis min GIS | 2 |
| Geog 522 | Research Design | 4 |
| Geog | Geographic Information Systems | 4 |
| 592/USP | II: Advanced GIS |  |
| 592 |  |  |
| Subtotal: 12 |  |  |
| Core GIS Competency Courses |  |  |
| Geog 590 | GIS Programming | 4 |
| Geog 575 | Digital Compilation and | 4 |
|  | Database Design |  |
| Geog 597 | Advanced SpatialQuantitative Analysis | 4 |

Subtotal: 8

## Non-GIS Topical

4 credits of graduate-level non-GIS courses (with approval of the committee)

Subtotal: 4

## SpecializedGeospatial Data Science Focus Area

Take two courses in one of the focus areas:
Area 1: Remote sensing and digital image analysis

| Geog 580 | Remote Sensing and Image <br> Analysis | 4 |
| :---: | :--- | :---: |
| Geog 581 | Digital Image Analysis I: <br> Geog 582 | Introduction <br> Digital Image Analysis II: <br> Advanced Remote Sensing |
| Geog 577 | Photogrammetry and LiDAR | 4 |
| Area 2: Cartography and geovisualization |  |  |
| Geog 584 | Cartographic Applications of | 4 |
| Geog 585 | GIS | 4 |
|  | Map Design and Production | 4 |

Geog 585 Map Design and Production
Area 3: Computer and information sciences
CS $520 \quad$ Object-Oriented Programming \&
CS 547 Computer Graphics 3
CS 549 Computational Geometry 3
CS 554 Software Engineering 3
Geog 575 Digital Compilation and 4
Database Design
Geog 590 GIS Programming
Geog 595 Maps, Models, and GIS 4
$\begin{array}{lll}\text { Area 4: Spatial statistics andquantitative methods } & \\ \text { ESM } & \text { EnvironmentalData Analysis } & 4 \\ \text { 566/CE 566 } & \end{array}$

| ESM 567 | Multivariate Analysis of EnvironmentalData | 4 |
| :---: | :---: | :---: |
| Geog 597 | Advanced SpatialQuantitative Analysis | 4 |
| Area 5: Systemand data science |  |  |
| CS 541 | Artificial Intelligence | 3 |
| CS 542 | Advanced ArtificialIntelligence: CombinatorialGames | 3 |
| CS 543 | Advanced ArtificialIntelligence: CombinatorialSearch | 3 |
| CS 545 | Machine Learning | 3 |
| SySc 514 | SystemDynamics | 4 |
| SySc 525 | Agent Based Simulation | 4 |
| SySc 527 | Discrete SystemSimulation | 4 |
| SySc 531 | Data Mining with Information Theory | 4 |
| SySc 535 | Modeling \& Simulation with R and Python | 4 |
| SySc 540 | Introductionto Network Science | 4 |
| SySc 552 | Game Theory | 4 |
| SySc 575 | AI: Neural Networks I | 4 |

Subtotal: 6-8
Students may need to complete additional courses to meet the prerequisite requirements for a course. Pleasecheck with the instructor before registering.

## GIS Practicum

| Geog 509 | Practicum |
| :---: | :---: |
|  | Subtotal: 6 |

## Eectives

| Graduate-levelGIS courses or seminars: |  |  |
| :--- | :--- | :--- |
| G 525 | Field GIS | 4 |
| Geog 507 | Seminar: Speaker Series | 1 |
| Geog 576 | 3D Terrain Analys is \& | 2 |
|  | Visualization |  |
| Geog 589 | Building a GIS Database with | 4 |
|  | GPS |  |
| Geog 594 | GIS for Water Resources | 4 |
|  |  | Subtotal: 7-9 |

Other elective courses may approved by the committee.
Total Credit Hours: 45

## GEOGRAPHY M.A./M.S.

See University master's degree requirements (p. 52). Specific departmental requirements are listed below.

## REQUIREMENTS

The student will plan a programof study with an adviser and other members of the supervisory committee during the first term of residence (the first termafter admission to the program). The programof study mustincludea minimum of 45 graduate credits for thesis students and 54
graduate credits for non-thesis students. Of these, a minimum of 36 graduate credits must be in geography for the thes is option, to include 6 credits of Geog 503 (Thes is); a minimum of 40 graduate credits must be in geography for the non-thesis option, including 3 credits of Geog 501 Research. Both thesis and non-thesis programs must include the following: Geog 521, Geog 522, and Geog 523.
Students seeking the M.A. degree must demonstrate their competence in the use of a foreign language for geographic research; those preparing for an M.S. degree must show proficiency in advanced skills in geography or an equivalent research technique ( 8 credits of Techniques/Skills coursework).
Students in the M.A. programmust complete a thesis. Those in the M.S. programmay choose between thesis and non-thesis options. The thesis option requires the presentation of the student's independent research into a topic approved by the student's graduate committee. It normally involves field work and is an original contribution to knowledge in the field of geography. A final oral examination by the student's committee includes defense of the thesis.

Candidates electing the non-thesis option must register for 3 credits of Geog 501 Research to rewrite, edit, and revise a research paper or project that must evolve fromgraduate coursework in geography at PSU. A final oral presentation of the paper is required for completion of the degree. All graduate students, whether in thes is or non-thesis programs, are encouraged to attend the department's colloquia.
The Geography Department follows the University requirement for minimum and continuous enrollment.

## Geology

17A Cramer Hall (CH)
725-3022
www.pdx.edu/geology

- B.A., B.S. in Geology
- B.A., B.S. in Earth Science
- Minor in Geology
- Minor in Environmental Geology
- Minor in Space and Planetary Science
- M.A.,M.S.
- M.A.T. and M.S.T. (Science/Geology)
- Professional Science Master's (P.S.M.) in Applied Geoscience
- Graduate Certificate in Engineering Geology
- Graduate Certificate in Environmental Geology
- Graduate Certificate in Hydrogeology
- Ph.D. in Earth, Environment, \& Society


## Undergra duate Programs

The Department of Geology offers programs leading to the bachelor's degree in geology and earth science, as well as studies in geochemis try, planetary science, volcanology, glaciology, hydrogeology, and environmental and engineering geology.
The programs serve both majors in geology and earth science and non-majors: those who may wish to broaden their science background; those preparing to teach general or earth sciences or geology in elementary or secondary schools; and those preparing for a master's or a doctoral degree.

Post-baccalaureate students (with a bachelor's degree not in geology) who wish to become professional geologists may complete this curriculumwhile doing both undergraduate and graduate work in geology.

Geologists are employed by government agencies at federal, state, county, and city levels; by independent consulting firms to work with engineers, architects and planners; in the construction, mining, and energy industries; and as teachers in elementary, middle and high schools and at the college level.
Geologists who have graduated fromPSU are employed in natural hazards analysis and planning, climate change research, assessment of ground and surface water resources, exploration, development and management of mineral and energy resources, geotechnical and geoengineering studies, urban planning and GIS, and instruction at all educational levels.

Students majoring in geology and earth science s hould plan to complete the required mathematics, chemistry, and physics courses as early in their programas possible.

## DEGREE MAPS AND LEARNING OUTCOMES

To view the degree maps and expected learning outcomes for Geology undergraduate degrees, go to
www.pdx.edu/academic-programs/a-z.

## ADMISSION REQUIREMENTS

Admission to the department is based on general admission to the University. See Admis sions Requirements (p. 8) for more information.

## GEOLOGY B.S./B.A.

In addition to meeting the general University degree requirements, the major must meet the following departmental requirements:

| REQUIREM ENTS |  |  |
| :---: | :---: | :---: |
| Geology Courses (46-47 credits): |  |  |
| G 201 | Dynamic Earth: Interior | 3 |
| G 202 | Dynamic Earth: Surface | 3 |
| G 204 | Geology Laboratory | 1 |
| G 205 | Geology Laboratory | 1 |
|  | or |  |
| G 207 | Computer Based Geology | 2 |
|  | Laboratory |  |
| G 203 | Historical Geology | 3 |
| G 206 | Historical Geology Lab | 1 |
| G 312 | Mineralogy | 3 |
| G 313 | Methods in Mineralogy | 2 |
| G 314 | Petrology | 3 |
| G 315 | Lithology and Petrography | 2 |
| G 318 | Processes in the Surface | 3 |
|  | Environment |  |
| G 319 | Processes in the Surface | 2 |
|  | Environment: Methods |  |
| G 324 | Data Management and Analysis | 5 |
| G 434 | Structural Geology and Tectonics | 5 |
| G 435 | Sedimentology and Stratigraphy | 5 |
| G 485 | Geologic Mapping | 4 |

4 credits of adviser-approved Field Camp may substitute for G485.

At least 16 credits of electives must be chosen from upper-division geology cours es numberedG 410 or higher (excluding G453):

This may include up to 8 credits of upper-division mathematics, science, or eng ineering courses approved by the undergraduate adviser. Students may use up to 4 credits from an approved summer field camp course.
Two terms of calculus plus one additional mathematics
$\begin{array}{lll}\text { or statistics course ( } \mathbf{1 2} \text { credits): } \\ \text { Mth } 251 & \text { Calculus I } & 4\end{array}$

| Mth 251 | Calculus I | 4 |
| :--- | :--- | :--- |
| Mth 252 | Calculus II | 4 |


|  | and |  |
| :--- | :--- | ---: |
| Mth 253 | Calculus III <br> or | 4 |
| Mth 261 | Introduction to Linear Algebra <br> or | 4 |
| Stat 451 | Applied Statistics for Engineers <br> and Scientists I | 4 |

AlliedSciences Courses ( $\mathbf{2 5}$ credits):
Two terms of 200 -level chemistry with labs:
Ch 221 General Chemistry I 4
Ch 227 General Chemistry Laboratory 1
Ch 222 General Chemistry II 4
$\begin{array}{lll}\text { G } 434 & \text { Structural Geology and Tectonics } & 5 \\ \text { G } 435 & \text { Sedimentology and Stratigraphy } & 5\end{array}$
G485 Geologic Mapping 4

Mth 252 Calculus II 4

Ch 228

Ph 201

Ph 202

Ph 203

Ph 211

Ph 212

Ph 213

Ch 223
Ch 229
Ph 202
Ph 215

Ph 212
Ph 215

Ph 203
Ph 216

Ph 213
Ph 216

General Chemistry Laboratory
Two terms of 200-level physics with labs:
General Physics 4
And
General Physics 4
or
General Physics
or
General Physics (with Calculus) 4
I
And
General Physics(with Calculus) 4
II
or
General Physics (with Calculus) 4
III
And
Lab for Ph 201 or Ph 211 or $\mathrm{Ph} \quad 1$
221 orPh 231
and
Lab for Ph 202 or Ph 212 or $\mathrm{Ph} \quad 1$
222 or Ph 232
or
Lab for Ph 203 or Ph 213 or $\mathrm{Ph} \quad 1$
223 orPh 233
One additional 200 -level chemistry or physics class with lab:

1

Lab for Ph 202 or Ph 212 or Ph
222 or Ph 232
or
General Physics (with Calculus) 4
II
Lab for Ph 202 or Ph 212 or $\mathrm{Ph} \quad 1$
222 or Ph 232
or
General Physics
Lab for Ph 203 or Ph 213 or Ph 1
223 or Ph 233
or
General Physics (with Calculus) 4
III
Lab for Ph 203 or Ph 213 or Ph
1

223 or Ph 233
or
Advis or-Approved 200+ level
Biology Course with Lab

Total CreditHours: 99-100
Courses taken under the undifferentiated grading option (pass/no pass) are not acceptable toward fulfilling departmental major requirements.

EARTH SCIENCE B.A./B.S.

## REQUIREMENTS

In addition to meeting the general University degree requirements, the major must meet the following departmental requirements:

## Geology Courses

| G 200 | Field Studies | 1 |
| :--- | :--- | :--- |
| G 201 | Dynamic Earth: Interior | 3 |
| G 202 | Dynamic Earth: Surface | 3 |
|  |  |  |
| G 204 | Geology Laboratory | 1 |
| G 205 | Geology Laboratory | 1 |
|  | or | 2 |
| G 207 | Computer Based Geology |  |
|  | Laboratory |  |
|  |  | 3 |
| G 203 | Historical Geology | 1 |
| G 206 | Historical Geology Lab | 3 |
| G 312 | Mineralogy | 2 |
| G 313 | Methods in Mineralogy | 3 |
| G 314 | Petrology | 2 |
| G 315 | Lithology and Petrography | 3 |
| G 318 | Processes in the Surface |  |
| G 319 | Environment | 2 |
|  | Processes in the Surface | 2 |

## At least 16 credits of electives must be chosen from upper-division geology courses

| May include either G 355 or G 450, but excludes: |  |  |
| :--- | :--- | :--- |
| G 301 | Geology for Engineers |  |
| G 340U | Life of the Past | 3 |
| G 341U | Geology of the Oregon Country | 4 |
| G 342U | Volcanoes and Earthquakes | 4 |
| G 344U | Geology and the National Parks | 4 |
| G 345U | Life in the Universe | 4 |
| G 346 | Exploring Mars | 4 |
| G 351U | Introductionto Oceanography | 4 |
| G 352U | Energy, Minerals, and the | 4 |
|  | Environment | 4 |
| G 355 | Earth and Space Sciences for | 4 |
|  | Elementary Educators |  |
| G 453 | Geology of the Pacific Northwest | 4 |

Up to 8 credits may be taken in upper-division math, science, or engineering.

| Eight credits from the following courses: |  |  |
| :--- | :--- | :--- |
| G 340U | Life of the Past | 4 |
| G 341U | Geology of the Oregon Country | 4 |
| G 342U | Volcanoes and Earthquakes | 4 |
| G 344U | Geology and the National Parks | 4 |
| G 345U | Life in the Universe | 4 |
| G 346 | Exploring Mars | 4 |
| G 453 | Geology of the Pacific | 4 |
|  | Northwest |  |

## Non-Geology Courses

8 credits of upper-division pre-approved sustainabilityrelated courses
Mathematics to include either
Option 1
Mth 251 Calculus I

| Option 2 |  | 4 |
| :---: | :--- | :---: |
| Mth 111 | Introductory College | 4 |
| Mth 112 | Mathematics I | Introductory College |

Mathematics II
or
passing the appropriate
placement test
And
Mth 212 Foundations Of Elementary 4
Mathematics II
Statistics to include:

| Stat 243 | Introduction to Probability and | 4 |
| :--- | :--- | :--- |
|  | Statistics I |  |
| Stat 244 | Introduction to Probability and | 4 |
|  | Statistics II |  |

Stat 244: recommended
AlliedSciences
One year of 200-level college 15
chemistry or equivalent with labs
One year of 200-level biology
plus labs
or
One year of 200-level physics 15
plus labs
Subtotal: 98-103
Cours es taken under the undifferentiated grading option (pass/no pass) are not acceptable toward fulfilling departmental major requirements.

## GEOLOGY MINOR

## REQUIREMENTS

To earn a minor in geology, a student must complete a minimum of 29 credits (at least 14 credits of which must be taken in residence at PSU), to include the following:
Courses

| G 200 | Field Studies | 1 |
| :--- | :--- | :--- |
| G 201 | Dynamic Earth: Interior | 3 |
| G 202 | Dynamic Earth: Surface | 3 |
| G 204 | Geology Laboratory | 1 |
| G205 | Geology Laboratory | 1 |
| G207 | or |  |
|  | ComputerBased Geology | 2 |
|  | Laboratory |  |
|  | Twenty upper-divisioncredits in | 20 |
|  | geology |  |

Subtotal: 29

## MINOR IN EARTH DATA SCIENCE

## REQUIREMENTS

To earn a minor in Earth Data Science, a student must complete 29 credits (at least 24 credits of which must be taken in residenceat PSU) to include the following:

| Courses |  |  |
| :---: | :--- | ---: |
| G 324 | Data Management and Analy sis | 5 |
| G 426 | Numerical Modeling of Earth | 4 |
|  | Systems |  |
|  | Five adviser-approved courses in | 20 |
|  | Data Science, with at least 4 <br> credits outside of geology |  |

Adviser-approved courses in Earth Data Science: these courses may come fromany unit in the University but may not include 405 reading/conference courses Subtotal: 29

ENVIRONMENTAL GEOLOGY MINOR

## REQUIREMENTS

To earn a minor in environmental geology, a student must complete a minimum of 29 credits (at least 14 credits of which must be taken in residence at PSU) to include the following:

## Courses

G 200
Field Studies
1
G 201
Dynamic Earth: Interior
G 202
Dynamic Earth: Surface
G 204 Geology Laboratory
G 205 Geology Laboratory

| G 207 | ComputerBased Geology Laboratory | 2 |
| :---: | :---: | :---: |
| G 460 | Soil Geomorphology or |  |
| G 461 | Environmental Geology | 4 |
| Sixteen upper-division credits chosen from: |  |  |
| G 312 | Mineralogy | 3 |
| G 313 | Methods in Mineralogy | 2 |
| G 318 | Processes in the Surface | 3 |
|  | Environment |  |
| G 319 | Processes in the Surface | 2 |
|  | Environment: Methods |  |
| G 324 | Data Management and Analysis | 5 |
| G 341U | Geology of the Oregon Country | 4 |
| G 424 | Geographical Information | 4 |
|  | Systems for the Natural Sciences |  |
| G 434 | Structural Geology and Tectonics | 5 |
| G 435 | Sedimentology and Stratigraphy | 5 |
| G 440 | Volcanology | 4 |
| G 443 | Ground Water Geology | 4 |
| G 448 | Chemical Hydrogeology | 4 |

SPACE PLANETARY SCIENCE MINOR

## REQUIREMENTS

To earn a minor in space and planetary science, a student must complete a minimum of 28 credits (at least 16 credits of which must be taken in residence at PSU), to include the following:
Eight credits selected from the following:

| G 201 | Dynamic Earth: Interior | 3 |
| :--- | :--- | :--- |
| G204 | Geology Laboratory | 1 |
| G 202 | Dynamic Earth: Surface | 3 |
| G 205 | Geology Laboratory | 1 |
|  | or |  |
| G207 | Computer Based Geology | 2 |
|  | Laboratory |  |

Ph $121 \quad 4$
Ph $122 \quad 4$
or
Ph 361U/Sci General Astronomy I 4
315U
Ph 362U/Sci General Astronomy II 4
316U

## Twenty credits of electives selected from the following

(may include other elective courses pre-approved by the undergraduate adviser.):
G 203 Historical Geology

| G 206 | Historical Geology Lab <br> or | 1 |
| :--- | :--- | ---: |
| G 340U | Life of the Past |  |
| G 345U | Life in the Universe | 4 |
| G 346 | Exploring Mars | 4 |
| G 456 | Astrogeology | 4 |
| G 446 | Meteorites | 4 |
| G 457 | Frontiers in Planetary Science | 4 |
| G 404 | Cooperative Education/Intemship | $1-2$ |
| G 405 | Reading and Conference | $1-2$ |

## Subtotal: 28

Pass/NoPass: Upperdivision courses must be taken for a letter grade to count toward fulfilling department minor requirements with the exceptions of G404 and G 405, which are offered only for pas s/nopass.

Prerequisite requirements exist only forG 446 Meteorites (G201 and one year of chemistry). This is the only course in the programthat has a prerequisite.

Students are encouraged to contact the Department of Geology and ask for the undergraduate adviser for help in designing a programleading to a minor in geology, environmental geology, or computer applications. Please contactDr. Alex Ruzicka for help with the space and planetary science minor.

## Graduate Programs

The Department of Geology offers programs leading to a graduate certificate, the Master of Arts or Master of Science in geology with an option in geohydrology, the Master of Arts in Teaching or Master of Science in Teaching (Science), the ProfessionalScienceMaster's (P.S.M.) in Applied Geoscience, and to the Earth, Environment, \& Society Doctoral Program.

The M.A./M.S. programis designed to train geology students beyond the baccalaureate degree for professional employment or for advanced graduate work. The M.A.T./M.S.T. programis offered for teachers in secondary schools and community colleges.
Geology participates in the Earth, Environment, \& Society Doctoral Program. Specialized studies in hydrogeology, geomicrobiology, environmental geology, engineering geology, geomech anics, glaciology, and applied stratigraphy, along with multidisciplinary en vironmental science courses and seminars, will partially fulfill the requirements for the Ph.D. See Earth, Environment and Society Ph.D. (p. 208) for information relative to the Ph.D. programin Earth, Environment, \& Society.

ADMISSION REQUIREMENTS

## Master of Arts and Master of Science

To be admitted to the graduate degree program, the student must have a baccalaureate degree in geology or its equivalent, as determined by the departmental graduate committee.

## Master of Arts in Teaching or Master of Science in Teaching

The College of Liberal Arts and Sciences offers the M.A.T./M.S.T. degrees in Science/Geology. To be admitted to the M.A.T./M.S.T. programin Science/Geology, a student must hold a bachelor's degree in geology, or in the physical or life sciences-including the equivalent of a minor in geology.

## Graduate Certificates

All PSU Graduate Certificate programs require admis sion by the University, and an applicant must have a bachelor's degree in Physical Sciences or Civil Engineering froman accredited institution and a cumulative GPA of at least 2.75 in all undergraduate courses. Applicants with cumulative undergraduate GPAs between 2.50 and 2.74 may be considered for conditional admission only.

## APPLIED GEOSCIENCE P.S.M.

The Professional ScienceMaster (PSM) in Applied Geoscience provides practicing geologists and postbaccalaureate students an opportunity to obtain skills relevant to professional geoscientists.

The cours ework foundation centers on the completion of two Geology Certificate options, to be selected among Engineering Geology, Environmental Geology, and Hydrogeology. In addition, the programinvolves a) an experiential component that can include internships and/or research projects with county, state and federal agencies, and private geologic consulting firms ; b) profes sional development courses focused on management and communication; and c) two courses that cover core skills (G 651 and G 523).

## Prerequisite:

BA or BS in Geology or Earth Science
OR
BA or BS in a physical science (e.g., Chemistry, Physics) with 5 years of experience in a geosciencerelated industry. Taking G 434 and G 318 OR G 435 may substitute for industry experience.

## CORE SKILLS

These courses should be completed as a requirement within the Certificates, below.
G 651 Research Methods II - Writing 4
G523 Statistics and Data Analysis in 4 the Geosciences

## CERTIFICATES (36 CREDITS)

Complete two graduate certificates fromthe following list (see certificate listings for details):
Engineering Geology (p. 274)
Environmental Geology (p. 275)
Hydrogeology (p. 276)
And an 4 additional credits from the certificate elective lists.

## PROFESSIONAL DEVELOPMENT (4 CREDITS)

| Selectedfrom the following list of courses: |  |  |
| :---: | :---: | :---: |
| EMCR | Community Resilience in | 4 |
| 567/Geog | Coupled Socio-Ecological |  |
| 567 | Systems |  |
| ESM 517 | Applied Watershed Restoration | 4 |
| ESM 534/Ec | Business Environmental | 4 |
| 534 | ManagementEconomics |  |
| ESM 535 | Natural ResourcePolicy and Management | 4 |
| ESM | The Ecology and Management | 4 |
| 540/Geog 540 | of Wildfire |  |
| ESM 551 | Project Management for | 4 |
|  | Scientists |  |
| ESM 552 | Environmental Regulation and | 3 |
|  | Non-regulatory Approaches |  |
| ESM | Science Communication | 1 |
| 555/ESR |  |  |
| 655 |  |  |
| ESM | Advanced Science | 1 |
| 556/ESR | Communication Skills |  |
| 656 |  |  |
| ESM | Science, Media and the Public: | 1 |
| 557/ESR | Working with the Media to |  |
| 657 | Create Effective Scientific |  |
|  | Messages |  |
| ESM 587 | Environmental Justice | 4 |
| ESM 588 | EnvironmentalSustainability | 4 |
| ESM 593 | Advanced Environmental | 2 |
|  | Science Lab and Field Methods |  |
| ETM 522 | Communication and Team | 4 |
|  | Building |  |


| ETM 545 | Project Management |
| :---: | :---: |
| Geog 512 | Global Climate Change Science and Socio-environmental Impact |
|  | Assessment |
| Geog 513 | Disturbance Biogeography of Pacific Northwest |
| Geog 545 | Resource Management Topics |
| Geog 546 | Water ResourceManagement |
| PA 555 | ProgramEvaluation and |
|  | Management |
| PA 564 | Environmental Policy and |
|  | Administration |
| PA 565 | Natural ResourcePolicy and |
|  | Administration |
| PA 566 | Water Resources Policy and |
|  | Administration |
| PA 567 | Energy Resources Policy and |
|  | Administration |

## EXPERIENTIAL COMPONENT (8 CREDITS)

Students may complete 8 credits of an internship or project, or 4 credits of an internship or project and 4 credits of graduate level Field Geology.

## Field Geology ( 4 credits) <br> G $581 \quad$ Field Geology

4

## Internship or Project (4-8 credits)

a. One to two terms of internship or project (4-8 credits).
b. At the beginning of the internship the student must meet with their employer or internship/project adviser to outline internship responsibilities and identify 2 to 3 major miles tones. At the halfway point of the internship the student will complete a self-as sessmentbased on the agreed upon milestones. At this time the internship/project adviser will complete a progress report to the PSU PSM faculty.
c. For a two-terminternship or project, a second selfas sessment and internship/project adviser progress report is required by the end of the first term.
d. An end of internship or project product is determined by employer or internship/project ad viser (i.e. report, presentation).
e. The student's internship/ project adviser will provide a final evaluation of the student's internship/project experience.
f. The PSU PSM faculty committee will complete a pass/no pass as sessment based upon the following: 1)
Original internship responsibilities and milestones, 2) Mid-
internship student self-assessment and internship/project adviser progress report. 3) End of internship product, 4) Final evaluation of the student's internship/project experience by the internship/project adviser.

## Additional Details for the Experiential Component

## Internship or Project (4-8 credits):

Students may complete either an 8 credit internship (equivalent to either two terms of 4 credit hours/week internship experience, or an accelerated 8 credit hours/week internship experience in one term), or students may complete a 4 credit internship (equivalent to one term of 4 credit hours/week internship experience), or students may complete two separate 4 credit internships with an 8 credit total. The faculty also encourage students with unique internship opportunities such as rapid hazard res ponse (e.g. landslide, debris flow, fire, earthquake, tsunami, volcanic events) to arrange to enroll in the appropriate average weekly credit hours for the term. Rapid res ponse to geologic hazards will require different time allocation in the days and weeks after an event, as a result the internship could be a concentrated effort in a period of weeks instead of over a full quarter. The internship project adviser and the PSU PSM faculty committee will advise the student on the average weekly credit hours for a rapid response hazards internship opportunity. Students employed as professional geologists may complete the internship component with their current employer, however the student must engage in new technical experiential activities and take on new responsibilities that meet guidelines for fulfillment of the internship.

When an internship begins the student must meet with their employer or internship/project advis er to outline the responsibilities of the intern, identify 2 to 3 major milestones to gauge the intern's progress. PSU PSM faculty will review and sign off on theoutlined internship expectations. At the half-way mark the student will review agreed upon miles tones and provide a self-assessment with a short explanation of progress toward those miles tones. The internship adv iser will review this self-assessment document and complete a progress report for the PSUPSM faculty. Both the self-assessment and the progress report will be reviewed by the PSU PSM faculty to gauge satisfactory progress.

For a two-terminternship or project, a second selfas sessment and internship/project adviser progress report is required by the end of the first term. See details provided in part b. above.

An end of internship product includes either a report or presentation. Presentations may be held at the internship granting agency, or at the Department of Geology at PSU. PSU PSM faculty will attend either in pers on or remotely,
arrangements will be made by the student in coordination with the internship adviser and PSU PSM faculty. At the conclusion of an internship products will be made publicly available as either recorded presentations and/or reports.

The student's internship/project adviser will provide a final evaluation of the student's internship/project experience. The adviser may reach out directly to thePSU PSM faculty at any point during the internship to communicate about the student's performance, or changes to the direction of the internship milestones and anticipated deliverables.

## Field Geology (4 credits):

G 581 may be replaced with an equivalent graduate level field course from another institution pending faculty approval. For this approval the studentmust provide the faculty with the following information: 1) A paragraph describing the proposed course replacement including the type of work to be completed in the proposed field, an explanation of why this replacement is necessary (e.g. time \& logistics, or the field courseoffers a section in the student's sub-discipline). 2) The graduate field course description for the other institution, and the web-address for this description. 3) A web addres s, flyer or email from the other institution that demonstrates suitable content covered in the course.
Total Credit Hours: 48

## GEOLOGY M.A./M.S.

See Univers ity master's degree requirements (p. 52). Specific departmental requirements for the M.S./M.A. Geology or the M.A./M.S. Geology-Geohydrology with a thesis option are:

1. Completion of a minimum of 45 credits in approved graduate courses.
a. Students must take G523 Statistics and Data Analy sis in the Geosciences unless already taken as G 423 as an undergraduate.
b. Students must take at least 8 credits in geology courses numbered G610 orhigher.
c. Students must take at least another 12 credits ( 16 credits if G 423 Computer Application in Geology was completed as an undergraduate) in the field of geology from G 510 or higher level courses.
d. A maximum of 9 credits will be allowed for courses numbered G501 Research, G504 Cooperative Education/Internship, G505 Reading and Conference, orG 506 Special Problems. These courses are offered forP/NP credit only.
e. Students must complete at least 6 credits of G503 Thes is (P/NP only); up to 9 credits can count for the degree.
2. The department will evaluate a student's record for deficiencies at the time of admis sion and develop a list of courses that must be completed for a grade of B or better in each course within a leng th of time specified in the admis sion letter.
3. Completion of field camp (could have been taken as an undergraduate) or equivalent field experience as approved by the field camp director.
4. Presentation of a thesis.
5. Completion of a final oral examination (thes is defense) taken before the end of the sixth week of the final term in residence.

## Specific departmental requirements for the M.A./M.S. Geology or the M.A./M.S. Ge ologyGeohydrology with a non-thesis (project) option are:

1. Completion of a minimum of 45 credits in approved graduate courses of which 36 must be for differentiated grades (A-F).
a. Students must take G523 Statistics and Data Analysis in the Geosciences unless already taken as G 423 as an undergraduate.
b. Students must take at least 8 credits in geology courses numbered G610 or higher.
c. Students must take at least another 12 credits ( 16 credits if G 423 Computer Application in Geology was completed as an undergraduate) in the field of geology from G 510 orhigher-level courses.
d. Student must complete 3 credits in G 501 Research.
e. A maximum of 3 additional credits will be allowed for courses numbered G 501 Research, G 504 Cooperative Education/Internship, G505 Reading and Conference, and G506 Special Problems or similarly numbered courses in other departments. These courses are offered for $\mathrm{P} / \mathrm{NP}$ credit only.
2. The department will evaluate a student's record for deficiencies at the time of admission and develop a list of courses that must be completed for a grade of B or better in each course within a length of time specified in the admission letter.
3. Completion of field camp (could have been taken as an undergraduate) or equivalent field experience as approved by the field camp director.
4. Presentation of a research project.
5. Completion of a final oral examination on the subject area and the research project.

GEOLOGY M.A.T./M.S.T.

In consultation with the graduate adviser, the student should establish the degree programbefore the completion of 16 credits of coursework. The programmust include a minimum of 45 credits in approved graduate courses, to include a minimum of 30 credits in geology and related sciences, and 6 credits in G506. At least 9 credits must be in education courses. In order to fulfill requirements for the degree, the student must satisfactorily complete the degree programand pass both a final written examination and a final oral examination.

## GRADUATE CERTIFICATE IN ENGINEERING GEOLOGY

## Purpose

The Graduate Certificate in Engineering Geology provides practicing geologists an opportunity to upgrade their engineering credentials and post-baccalaureate students in an acces sible way to obtain skills in engineering geology while partially fulfilling requirements towards a Professional Masters. The certificate is des igned to accommodate professionals and students who are employed full or part-time.

## Career Opportunities

This Certificate is designed for professionals and students interested in the field of engineering geology. It can represent a portion of a professional geologist's training, as well as a portion of the background needed by registered professional engineering geologists in the stateof Oregon. Practicing geologists can use this Certificate, which indicates added skills and background, for professional development. This Certificate programalso can be used towards a graduate degree.

## CHOOSE 1 COURSE FROM EACH OF THE FOLLOWING 4 SECTIONS:

| Required: $\text { G } 570$ | Engineering Geology | 4 |
| :---: | :---: | :---: |
| Choose One: |  |  |
| G 650 | Research Methods I-Reading | 4 |
| G 651 | Research Methods II - W riting | 4 |
| G 523 | Statistics and Data Analysis in the Geosciences | 4 |
| Choose One: |  |  |
| CE 537 | Earthquake Engineering | 4 |
| CE 541 | Advanced SoilMechanics | 4 |
| CE 542 | In Situ Behavior and Testing of Soils | 4 |
| CE 543 | Introduction To Geotechnical Earthquake Engineering | 4 |
| CE 544 | Advanced Shallow Foundation Design | 4 |

Choose One:
G 651 Research Methods II - Writing Statistics and Data Analysis in the Geosciences

## Choose One:

E 537
CE 541
anced SoilMechanics Soils
Introduction To Geotechnical
Advanced Shallow Foundation
Design

| CE 546 | Numerical Methods in Soil- <br> Structure Interaction <br> Deep Foundation Design and <br> Analysis | 4 |
| :--- | :--- | ---: |
| CE 549 | 4 |  |
| CE 550 | Transportation Safety Analysis | 4 |
| CE 569 | Subsurface Hy drology <br> Reog 580 <br> Remote Sensing and Image | 4 |
| Analy |  |  |$\quad 4$

## Total CreditHours: 16

Courses must be completed within seven years of the award of the Graduate Certificate, and a cumulative GPA of 3.00 must be attained in all courses to be used for the Certificate. At least two thirds of the credits for the Graduate Certificate, or 15 credits, whichever is larger, are required to be taken at Portland State University.

## GRADUATE CERTIFICATE IN ENVIRONMENTAL GEOLOGY

## Purpose

The Graduate Certificate in Environmental Geology provides practicing geologists an opportunity to upgrade their environmental credentials and post-baccalaureate students an accessible way to obtain skills in environmental geology while partially fulfilling requirements towards a Profes sional Masters. The certificate is designed to accommodate professionals and students who are employed full or part-time.

## Career Opportunities

This Certificate is designed for professionals and students interested in the field of environmental geology. It can represent a portion of a professional geologist's training, as well as a portion of the background needed by regis tered
geologists in the state of Oregon. Practicing geologists can use this Certificate, which indicates added skills and background, for professional development. This Certificate programcan also be used towards a graduate degree.

CHOOSE 1 COURSE FROM EACH OF THE FOLLOWING 4 SECTIONS:

| Required: G 561 | Environmental Geology | 4 |
| :---: | :---: | :---: |
| Choose One: |  |  |
| G 650 | Research Methods I-Reading | 4 |
| G 651 | Research Methods II - Writing | 4 |
| G 523 | Statistics and Data Analysis in the Geosciences | 4 |
| Choose One: |  |  |
| G 524 | Geographical Information | 4 |
|  | Systems for the Natural Sciences |  |
| G 525 | Field GIS | 4 |
| G 543 | Ground Water Geology | 4 |
| G 545 | Geochemistry | 4 |
| G 548 | Chemical Hydrogeology | 4 |
| G 562 | Hillslope Materials and | 4 |
|  | Processes |  |
| G 581 | Field Geology | 4 |
| G 619 | Topics in Geochemistry | 4 |
| Choose One: |  |  |
| CE 561 | Water Resource Systems | 4 |
|  | Analysis |  |
| CE | Watershed Hydrology | 4 |
| 565/ESM |  |  |
| 525 |  |  |
| CE | Environmental Data Analysis | 4 |
| 566/ESM |  |  |
| 566 |  |  |
| CE 568 | Advanced Methods in | 4 |
|  | Hydrologic SystemAnalysis |  |
| CE 569 | Subsurface Hydrology | 4 |
| CE 571/CE | Subsurface Contaminant | 4 |
| 671 | Transport |  |
| CE 572 | EnvironmentalFluid Mechanical | 4 |
|  | Transport |  |
| CE 573 | Numerical Methods in | 4 |
|  | Environmental and Water |  |
|  | Resources Engineering |  |
| CE 576 | EnvironmentalFluid Mechanics | 4 |
| CE 578 | WaterQuality Modeling | 4 |
| CE | Fate and Transport of Toxics in | 4 |
| 579/ESM | the Environment |  |
| 579 ( |  |  |
| CE 580 | Chemistry of Environmental | 4 |
|  | Toxins |  |


| CE 582 | Introductionto Sediment | 4 | Total Credit Hours: 16 |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | Transport |  | Courses must be completed within seven years of the |  |  |
| CE 583 | Estuarine Circulation | 4 |  |  |  |
| CE 585 | EnvironmentalCleanupand Restoration | 4 |  |  |  |
|  |  | 4 | Certificate. At |  |  |
| CE 586/Ch | Environmental Chemistry | 4 | Graduate Certificate, or 15 credits, whichever is larger, are required to be taken at Portland State University. |  |  |
| CE 587/Ch | Aquatic Chemistry | 4 |  |  |  |
| CE 589 |  |  | GRADUATE CERTIFICATE IN |  |  |
|  | Introduction to Advanced EnvironmentalFluid Mechanics | 4 | HYDROGEOLOGY |  |  |
| CE 590 | Soil and Ground water Restoration | 4 | Purpose |  |  |
| ESM 516 | EcosystemRestoration | 4 | The Graduate Certificate in Hydrogeology provides practicing geologists an opportunity to upgrade their hydrogeology credentials and post-baccalaureate students an accessible way to obtain skills in hydrogeology while partially fulfilling requirements towards a Professional Masters. Thecertificate is designed to accommodate professionals and students who are employed full or parttime. |  |  |
| ESM 517 | Applied WatershedRestoration | 4 |  |  |  |
| ESM | Landscape Ecology | 4 |  |  |  |
| 518/Geog |  |  |  |  |  |
| ESM 520 | Ecological Toxicology | 4 |  |  |  |
| ESM 527 | Watershed Biogeochemistry | 4 |  |  |  |
| ESM 529 | Environmental Impact Assessment | 4 |  |  |  |
| $\begin{aligned} & \text { ESM 533/Ec } \\ & 533 \end{aligned}$ | Natural ResourceEconomics | 4 | Career Opportunities |  |  |
| ESM 535 | Natural ResourcePolicy and Management | 4 | This Certificate is designed for professionals and students interested in the field of hydrogeology. It can represent a |  |  |
| ESM 552 | Environmental Regulation and | 3 | portion of a profes sional geologist's recognized training, as well as a portion of the background needed by regis tered |  |  |
| ESM 563 | Water Quality Policy \& Management | 4 | geologists in the state of Oregon. Practicing geologists can use this Certificate, which indicates added skills and |  |  |
| ESM 567 | Multivariate Analysis of Environmental Data | 4 | background, for professionaldevelopment. This Certificate programalso may be used toward a graduate degree. |  |  |
| Geog 514 | Hydrology | 4 | CHOOSE 1 COURSE FROM EACH OF THE FOLLOWING 4 SECTIONS: |  |  |
| Geog 515 | Soils and Land Use | 4 |  |  |  |
| Geog 546 | WaterResourceManagement | 4 |  |  |  |
| Geog 547 | Urban Streams | 4 | Required: |  |  |
| Geog 548 | The Urban Forest | 4 | G 543 | Ground Water Geology | 4 |
| Geog 580 | Remote Sensing and Image | 4 | Choose One: |  |  |
|  | Analysis |  | G 650 | Research Methods I-Reading | 4 |
| Geog | Geographic Information Systems | 4 | G 651 | Research Methods II - Writing | 4 |
| 588/USP | I: Introduction |  | G 523 | Statistics and Data Analysis in | 4 |
| 591 |  |  |  | the Geosciences |  |
| Geog | Geographic Information Systems | 4 | Choose One: |  |  |
| 592/USP | II: Advanced GIS |  | G 524 | Geographical Information | 4 |
| 592 |  |  |  | Systems for the Natural Sciences |  |
| Geog 594 | GIS for Water Resources | 4 | G 525 | Field GIS | 4 |
| Geog 596 | Introduction to Spatial | 4 | G 548 | Chemical Hydrogeology | 4 |
| Geog 597 | Quantitative Analysis |  | G 561 | Environmental Geology | 4 |
|  | Advanced Spatial Quantitative | 4 | G 580 | Basin Analysis | 4 |
|  | Analysis |  | G 581 | Field Geology | 4 |
| **If G 524 or G 525 is taken toward this certificate, then |  |  | Choose One: |  |  |
| Geog 588, Geog 592, and Geog 594 may not be taken from this list to counttoward these 4 credits. |  |  | $\begin{aligned} & \text { CE } \\ & 565 / \mathrm{ESM} \\ & 525 \end{aligned}$ | Watershed Hydrology | 4 |


topics. Hst 490 Comparative W orld History - a thematic course - is required for the major to ensure that students develop the ability to frame what they know in a world his torical context and to apply comparative analysis to important historicaltopics. Advising is critical, because majors are encouraged to develop their own thematic, chronological, or geographical focus through their choice of upper-division elective courses.
In line with the University's mission as an urban, public institution, the Department of History supports internships and partnerships with the Oregon Historical Society and other local and regional museums, archives, and his torical societies and offers training in public history. All faculty consider both teaching and research, along with community service, to be part of their responsibilities as members of the Department of History. The creation of knowledge, as well as its dis semination through teaching and publication, is a vital part of the department's miss ion.

## DEGREE MAPS AND LEARNING OUTCOMES

To view the degree maps and expected learning outcomes for History's undergraduate degrees, go to
www.pdx.edu/academic-programs/a-z.

## ADMISSION REQUIREMENTS

Admis sion to the department is based on general admis sion to the University. See Admis sions Requirements (p. 8) for more information.

## HISTORY B.A./B.S.

## REQUIREMENTS

In addition to meeting the general University degree requirements, the major in history must meet the departmental requirements listed:

## Courses

$$
\text { Lower-division history electives } 20
$$

(20 maximum)
Hst 300
Historical Imagination
Hst $490 \quad$ Comparative World History 4
Hst 491 Reading Seminar 4
Hst 492

$$
\begin{aligned}
& \text { Research Seminar } \\
& \text { Upper-division electives in }
\end{aligned}
$$

history

Upper-division electives: Selected in consultation with their adviser, thesecourses may be geographic, thematic, or period-based.

- All courses are to be taken for differentiated grades, and the history major must earn at least a C - in each course presented to meet major requirements.
- Of the electives students apply to the upper-division history major requirements, at least two courses must examine a non-European and non-U.S. subject, and at least two courses must examine either Europe or the United States.
- Students are required to take at leastone linked Reading Seminar (491) and Research Seminar (492) sequence.
- A minimum of 20 credits in history must be taken at the 400 -level (including courses that count toward other major requirements, such as Hst 490, Hst 491, and Hst 492).
- A maximum of 20 lower-division credits in history may be applied to the major requirements.
- A minimum of 32 credits in history must be taken in residence at Portland State University.
Total Required Credits in History: 60


## HISTORY HONORS OPTION

The honors track in history affords outstanding history majors the opportunity to propose, carry out, and formally present independent research on a topic of their choosing, under the guidance of a faculty adviser. Students who successfully complete an approved the sis and its as sociated 14 or 16 credit-hour department honors curriculum will be formally designated History Honors graduates and receive notice of this distinction on their diplomas. Students who wish to pursue thehonors in history option must apply to do so after having completed a minimum of 24 credit hours in the major and before they have attained senior standing. The history honors option requires a 3.50 GPA in history prior to admis sion to the program.

The history honors option requires an undergraduate thesis which students produce in their junior and senior years. Following successful admission to the program, during the junior year the studentdevelops a thesis topic in a reading and conference course (fourcredits of Hst 405) directed by a faculty member who has agreed to supervise the student's honors thesis. In the senior year, the first term is devoted to research (four credits of Hst 401), the second term to writing (four credits of Hst 403), and the third to presentation and revision of the thesis (two to four credits of Hst 403).

## HISTORY MINOR

## REQUIREMENTS

To earn a minor in history a student mustcomplete 28 credits, 16 of which must be at the upper division level and 8 at the 400 level.
Subtotal: 28

- All courses are to be taken for differentiated grades and the history minor must earn at leasta $C$ - in each course presented to meet minor requirements.
- A minimum of 16 credits in his tory in residence at Portland State University is required.


## WORLD HISTORY MINOR

## REQUIREMENTS

The W orld History Minor requires the completion of 28 credits fromthe following list of courses.

## Required Courses

| Hst 390U | Topics in World History |
| :--- | :--- |
| Hst 490 | Comparative World History |

Hst 490 Comparative World History
Electives
Lower Division

| Hst 104 | Introduction to W orld History |
| :--- | :--- |
| Hst 105 | Introduction to W orld History |
| Hst 106 | Introduction to W orld History |

Hst 106 Introduction to W orld History 4

| Upper Division |  |  |
| :--- | :--- | :--- |
| Hst 339U | The Environment and History | 4 |
| Hst 361U | Modern France \& the World <br> since 1815 | 4 |
| Hst 369U | Women in World History | 4 |
| Hst 387U | History of Modern Science | 4 |
| Hst 390U | Topics in World History | 4 |
| Hst 413 | Topics in Transnationalism | 4 |

Students must complete 16 credits at the upper-division level, 4 of which must be at the 400 level.

## Total CreditHours: 28

All courses are to be taken for differentiated grades; pass/no pass courses cannotbe counted toward the minor. Students must earn at leasta C- in each course presented to meet minor requirements.

A minimum of 16 credits in History in residence at Portland State University is required for the minor.

## SCIENCE, TECHNOLOGY, AND SOCIETY INTERDISCIPLINARY MINOR

In the Minor in Science, Technology, and Society, students use multidisciplinary perspectives to study science and its applications as a systemof knowledge and as a social institution. Goals are to gain a deeper appreciation of reas oning and evidence in science; of the historical development of science and related disciplines; and of the social, cultural, political and ethicalcontexts of science and technology.

This interdis ciplinary Minor in Science, Technology, and Society requires 24 credits distributed as follows:

| Three core courses (12 credits) chosen from: |  |  |
| :--- | :--- | :--- |
| Hst 387U | History of Modern Science | 4 |
| Hst 427 | Topics in the History of Science | 4 |
| NAS 392 | Indigenous Ways of Knowing | 4 |
| Phl 307U | Science and Society | 4 |
| Ph1 470 | Philosophy of Science | 4 |
| Sci | Science, Gender, and Social | 4 |
| 347U/WS | Context I |  |
| 347U |  | 4 |
| Sci 359U | Biopolitics |  |

Three elective courses ( 12 credits) chosen from:
Anth 325U Culture, Health, and Healing 4
Anth $414 \quad 4$
Bi 346U/WS Genes and Society 4
346U
Comm 416 Communicating Environmental 4
CS 345 Cyberculture:The Internet and 4
Popular Culture
CS Exploring Complexity in
346U/SySc Science and Technology
346U
Ec 460 History of Economic Thought 4
Eng 307U Science Fiction 4
Eng 397U Digital Literary Studies 4
Eng 498 Ecology, Criticism, and Culture 4
ESM 330 Environmentaland Ecological 4
G 340U Life of the Past 4
Geog 347U Environmental Is sues and Action 4
Geog 366U Historical Geography of North 4
Hst 339U The Environment and History 4
Hst 427 Topics in the History of Science 4
Hst 440 American Environmental 4
Hst $460 \quad$ Topics in European Intellectual 4
History
Hst 490 Comparative World History: 4
Empires of Knowledge
Hst 490 Comparative World History: 4
Mth 486 Topics in The History of 3
Mathematics
Phl 301U Ancient Philosophy 4
Phl 303U Early Modern Philosophy 4
Phl 306U Science and Pseudoscience 4
Phl 318U Philosophy of Medicine 4
Phl 355U Morality and Health Care 4
Phl $470 \quad 4$
Phl 471 Topics in Philosophy of Science 4

| PS 319U | Politics of the Environment |
| :--- | :--- |
| Sci 321U | Energy and Society I |
| Sci | Science, Gender, and Social |
| 348U/WS | Context II |
| 348U |  |
| Sci 355U | Science Through Science Fiction |
| Sci | The Science of Gendered Bodies |
| 365U/WS |  |
| 365U |  |
| Soc 459 | Sociology of Health and |
|  | Medicine |

Any course from the core list may count towards the elective requirements once the 12 -credit core requirement has been fulfilled.

Hst 427: if used as a core course may be, with a different topic, repeated as an elective
Hst 460: with different topics, may be repeated for credit
Students should take note of any prerequisites established by the respective departments.
For advising concerning the minor, consult the History Department office.

## MINOR IN MEDIEVAL AND EARLY MODERN STUDIES

The Minor in Medieval and Early Modern Studies is an interd isciplinary program with courses offered in the departments of Anthropology, Art His tory, Chicano/Latino Studies, English, History, Judaic Studies, Music,
Philosophy, World Languages and Literatures, and Theatre and Film. Students will fulfill 28 credits of coursework in a minimum of three disciplines, distributed as follows:

- Courses must be completed in at least three separate departments or programs;
- At least 20 credit hours must be completed in upperdivis ion courses, with at least 4 of those credit hours at the 400-level.


## REQUIREMENTS

## Courses may be selected from the list below:

| Anth | African Prehistory | 4 |
| :--- | :--- | :--- |
| $362 \mathrm{U} / \mathrm{BSt}$ |  |  |
| 362U <br> Anth 364U | The Archaeology of the Pacific <br> Northwest | 4 |
| Anth 365U | The Archaeology of North | 4 |
| Anth 366U | America <br> The Archaeology of <br> Mesoamerica | 4 |
| Anth 368U | The Archaeology of Oceania <br> ArH 205 | Art History: The Medieval <br> World |


| ArH316U | Japanese Buddhist Art | 4 |
| :---: | :---: | :---: |
| ArH329 | Is lamic Art: Major Themes and | 4 |
|  | Periods: |  |
| ArH355U | MedievalMonsters | 4 |
| ArH 356U | Early Medieval Art and | 4 |
|  | Architecture |  |
| ArH 357U | By zantine Art and Architecture | 4 |
| ArH 358U | Medicine and Magic in | 4 |
|  | Romanesque Art |  |
| ArH 359U | Gothic Art and Architecture | 4 |
| ArH 360U | The Art of W ar: Representing the Crusades | 4 |
| ArH361U | Northern Renaissance Art | 4 |
| ArH371U | Italian Renais s ance Art | 4 |
| ArH 372U | Italian Renais s ance Art | 4 |
| ArH 373U | Italian Renais s ance Art | 4 |
| ArH 376U | Italian Baroque Art | 4 |
| ArH 377U | Dutch and Flemish Baroque Art | 4 |
| ArH378U | Spanish Baroque Art | 4 |
| ArH379U | Latin American Baroque Art | 4 |
| ArH 432 U | Issues in Gender and Art | 4 |
| ArH 474 | Art and the Early Modern City | 4 |
| Art | History of Dress I | 4 |
| 322U/TA |  |  |
| 322 U |  |  |
| BSt | African History, Before 1800 | 4 |
| 305U/Hst |  |  |
| 312U |  |  |
| ChLa 340 | Mayas, Aztecs, and Chicanos | 4 |
| Chn 311 | Introductory Clas sical Chinese | 4 |
| Chn 312 | Introductory Classical Chinese | 4 |
| Eng 201 | Introduction to Shakespeare | 4 |
| Eng 204 | Survey of British Literature I | 4 |
| Eng 319U | Northern European Mythology | 4 |
| Eng 340U | MedievalLiterature | 4 |
| Eng 341U | Renais sance Literature | 4 |
| Eng 416 | History of Rhetoric | 4 |
| Eng 426 | Advanced Topics in Medieval Literature | 4 |
| Eng 441 | Advanced Topics in Renaissance | 4 |
|  | Literature |  |
| Eng 491 | History of Literary Criticism and Theory I | 4 |
| Fr 490 | History of the French Language | 4 |
| Grk 101 | First-Year Ancient Greek Term | 4 |
|  | 1 |  |
| Grk 102 | First-Year Ancient Greek Term | 4 |
|  | 2 |  |
| Grk 103 | First-Year Ancient Greek Term | 4 |
|  | 3 |  |
| Grk 201 | Second-Year Ancient Greek | 4 |
|  | Term 1 |  |
| Grk 202 | Second-Year Ancient Greek | 4 |
|  | Term 2 |  |


| Grk 203 | Second-Year Ancient Greek Term 3 | 4 |
| :---: | :---: | :---: |
| Hst 101 | Age of Empires: The Medieval World | 4 |
| Hst 102 | Early Modern Europe and the World | 4 |
| Hst | Jewish History from Antiquity to | 4 |
| 317U/JSt 317 U | the Medieval Period |  |
| Hst | Rabbinic Culture in the Roman | 4 |
| 319U/JSt | World |  |
| Hst 320U | East Asian Civilizations | 4 |
| Hst 321U | Early Modern East Asia, 13001800 | 4 |
| Hst 350U | English History from 1066 to $1660$ | 4 |
| Hst 352U | European Women's His tory to 1700 | 4 |
| Hst 354U | Early MedievalEurope: 3001100 | 4 |
| Hst 355U | Late MedievalEurope, 1100- $1450$ | 4 |
| Hst 356U | Renais sance and Reformation Europe, 1400-1600 | 4 |
| Hst 357U | Europe from Reformation to Revolutions | 4 |
| Hst 359U | Early Modern France | 4 |
| Hst 365U | History of Latin America, 4000 $\text { BCE - } 1810$ | 4 |
| Hst 375U | History of Kievan and Muscovite Russia, 800s-1700 | 4 |
| Hst <br> 378U/JSt <br> 378U | Pagans, Christians and Jews | 4 |
| Hst | Kabbalah: The Jewish Mystical | 4 |
| $\begin{aligned} & 381 \mathrm{U} / \mathrm{JSt} \\ & 381 \mathrm{I} \end{aligned}$ | Tradition |  |
| Hst 384U | Ottoman World | 4 |
| Hst 416 | Topics in Roman History | 4 |
| Hst 420 | Topics in Early Modern Japanese His tory | 4 |
| Hst 450 | MedievalEngland | 4 |
| Hst 451 | Early Modern England | 4 |
| Hst 452 | Topics in the History of European Women | 4 |
| Hst 453 | The Medieval City: Communities of Conflict and Consensus | 4 |
| Hst 454 | Topics in Medieval History | 4 |
| Hst 455 | Topics in Renais sance History | 4 |
| Hst 456 | Religious Changein Sixteenth Century Europe | 4 |
| Hst 457 | Topics in Early Modern Europe | 4 |



| ArH450 | Great Periods and Themes in Art <br> and Architecture | 4 |
| :--- | :--- | ---: |
| Fr 441U | Major Works In Translation | 4 |
| Hst 461 | Topics in Jewish History | 4 |
| Hst 491 | Reading Seminar | 4 |
| Hst 492 | Research Seminar | 4 |
| Jpn 341U | Topics in Japanese Literature (In | 4 |
|  | Translation) |  |
| Phl 451 | ClassicalFigures |  |
| Span 421 | Major Topics:Peninsular Prose | 4 |
| Span 422 | Major Topics:Peninsular Drama | 4 |
| Span 423 | Major Topics:Peninsular Poetry | 4 |
| Span 434 | Major Topics:Peninsular | 4 |
|  | Multiple Genres |  |
| Span 441 | Major Works in Translation | 4 |
| TA 471 | Theater History:Periods and | $1-4$ |
|  | Topics |  |
| All courses mustbe passed with a C- or better. |  |  |
| For advising concerning the minor, pleaseconsult the |  |  |
| History Department office at hist @ pdx.edu. |  |  |

## Graduate Program

## ADMISSION REQUIREMENTS

## Master of Arts

The Department of History offers a Master of Arts degree. The degree programis designed to develophistorians with special competence by systematic training in the content, methods, and interpretation of history. Althougheach degree programwill vary, as will the individual's purpose for pursuing graduate work, the same level of scholarly competence and intellectual attainment is expected of all students.

To be considered for admission to the graduate study, applicants normally should have the minimum preparation undertaken by an undergraduate major in history and should demonstrate good research and writing skills. Most students admitted to the programhave maintained a GPA of at least 3.50 in upper-division history courses. Nonhistory majors or students with a lowerhis tory GPA may be considered for admission to the graduate programon a qualified bas is. In addition to the University application for graduate studies, students are required to submit:

- Two letters of recommendation fromfaculty or other individuals who can evaluate their preparation for graduate studies,
- A statement of purpose, describing their objectives in graduate study,
- Two examples of their writing, preferably history research papers.
- Foreign students must comply with the University requirements of a minimum grade of 550 in the Test of English as a Foreign Language (TOEFL).
Applications for fall-term admis sion are due by February 1.

HISTORY M.A.
See Univers ity master's degree requirements (p. 52). Specific departmental requirements for the M.A. in history are listed below.

## ALL STUDENTS

Foreither track in history a minimum of 45 credits of approved graduate-level courses are required for the M.A. in history. Of these 45 credits students must complete a minimum of 32 credits in history, including HST 500 (Introduction to the Master's Programin History) and at least one HST 591-HST 592 seminar sequence. Per university policy all students must complete the second language requirement outlined below. Students are strongly ad vised to take HST 500 in their first term of the program. Students will enter one of the following tracks. Students may enter either track at any time but they must still fulfill all of the requirements.

## THESIS TRACK

Students in the thesis track must complete the following:

- prepare a proposal outlining their area of study (defined geographically and/or thematically), any preparatory courses necessary for their thesis, and their thes is topic that must be approved by the student's adviser, who must be a tenured or tenure-track faculty member of the History Department.
- enroll in a minimum of 6 credits (a maximum of 9 may be counted towards the degree) of HST 503 (Thes is) in which they will complete their thesis.
- defend the thesis in an oral examination before a committee comprising the thesis adviser and two other tenured or tenure-track members of the History Department, one of whomshould be someone with whom the student has not taken a course. A fourth committee member from outside the History Department (if the adviser deems it necessary or advisable) may be added.
- after completing any necessary revisions, the student must submit the thesis to the Graduate School.


## EXAMINATION TRACK

Students in the examination track must complete the following:

- a second HST 592.
- prepare a proposal outlining an area of study (defined geographically and / or thematically), and any preparatory courses necessary for their written examination that must be approved by the student's adviser, who mustbe a regular (tenured or tenure-track) faculty member of the History Department.
- enroll in 4 credits of HST 506 (Project) during their final term before graduation in which they will complete their examination.
- complete a written examination (while enrolled in HST 506) on their area of study which will be graded Pass or Fail by the adviser who must be a tenured or tenuretrack member of the History Department.


## SECOND LANGUAGE

Graduate Students should demonstrate proficiency in a second language no later than the point at which they have completed 32 credits of graduate study. Per university policy, proficiency may be demonstrated by successfully completing language coursework equivalent to PSU's 203level course, orby passing an examination administered for this purpose by the Department of W orld Languages and Literatures. However, some fields of research may require language preparation beyond the formal University requirements. All M.A. students are urged to consult their advisers about expectations for study of languages prior to or soon after admission to the program.

## PUBLIC HISTORY CONCENTRATION

Students wishing to pursue a career in public history are urged to consider the department's public history M.A. concentration. Coursework is comprised of a balance of clas sroomand practical offerings, including supervised internships. Students in the thesis track may select a thesis topic within the public his tory field and/or one that makes use of public history methods (i.e., oralor digital history). Students in the examination track may select public history as their field of study. In addition to fulfilling all other requirements for a Master of Arts in history in the track of their choosing, students are als o required to complete the following:

## 1. Required Courses

Hst 593
Introduction to Public History
4
(unless student has successfully completed this course as an undergraduate)

## 2. a digital public history portfolio

To be approved by the student's advisor and submitted to the department as documentation of the student's public history work.

## 3. one public history seminar

Hst 594 Public History Seminar
4
4. a minimum of 6 public history internshipcredits

Hst $504 \quad$ Public History Internship 6
5. one public history lab course

Hst 595 Public History Lab

## WORLD HISTORY CONCENTRATION

A specialization in world history is available through the department's world history M.A. concentration. Students pursuing the world history concentration must fulfill all the requirements for a M.A. in History, in the track of their choosing, as well as:

## 1.8 credits of Hst 590 Comparative World History

An appropriate advis or-approved course can replace4 credits of Hst 590.
2.8 credits in fields other than that covered by the Hst 591-Hst 592 seminar.

## Indigenous Nations Studies

150 Parkmill Building (PKM)
503-725-5920
www.pdx.edu/indigenous-nations-studies/

- B.A., B.S. in Indigenous Nations andNative American Studies
- Minor in Indigenous Nations Studies

Indigenous Nations Studies (INST) is an interdisciplinary department with coursework drawn fromemerging and Native scholars and interweaves Indigenous Ways of Knowing with elements from Anthropology, English, History, Public Administration, Social Work, and other departments and schools. The substantive focus of this curriculumis the sovereignty, scholarship and cultures of American Indians, Alaska Natives, and global Indigenous communities.

## Undergraduate programs

## DEGREE MAPS AND LEARNING OUTCOMES

To view the degree maps and expected learning outcomes for Indigenous Nations Studies' undergraduate degrees, go to www.pdx.edu/academic-programs/a-z.

## ADMISSION REQUIREMENTS

Admission to the programis based on general admission to the University. See Admis sions Requirements (p. 8) for more information.

## INDIGENOUS NATIONS AND NATIVE AMERICAN STUDIES B.A., B.S.

The major in Indigenous Nations and Native American Studies (INNAS) is 56 credits.

The major focuses on critical studies and practices of Tribal race theory, decolonizing methodologies, traditional and cultural ecological knowledge, and contemporary themes, such as community health, food sovereignty, Indigenous land/resource management, community development, resilience, and self-determination.

## COURSE OF STUDY

| Core Courses ( 24 credits) |  |  |
| :---: | :---: | :---: |
| NAS 201 | Introduction to Native American | 4 |
|  | Studies |  |
| NAS 344 | Indigenous Women Leadership | 4 |
| NAS 346 | Contemporary Is sues in Indian | 4 |
|  | Country |  |
| NAS 392 | Indigenous Ways of Knowing | 4 |
| NAS 426 | Tribal Critical Race Theory | 4 |
| NAS 442 | Decolonizing Methodologies: | 4 |
|  | Insurgent Research and |  |
|  | Indigenous Education |  |
| Subtotal: 24 |  |  |
| Experiential Learning Requirement (8 credits) |  |  |
| NAS 404 | Cooperative Education/Internship | 4 |
| NAS 407 | Indigenous Ecological Healing | 4 |

Subtotal: 8

## Capstones

Students may complete these capstones as electives in INNAS, but must do so outside of their UNST graduation requirements. Students may seek approval fromUNST to allow use of a single capstone to serve as both an INNAS elective and a UNST caps tone requirement.

| UnSt 421 | Cultural and Ecological <br> Education | 6 |
| :--- | :--- | :--- |
| UnSt 421 | Environmental Education <br> ThroughNative American | 6 |
| UnSt 421 | Lenses <br> Indigenous Grantwriting | 6 |
| UnSt 421 |  <br> UnSt 421 | Empowerment at NAYA <br> Healing and Indigenous |
| UnSt 421 | Education at NA YA <br> Environmental Justice and <br> Salmon | 6 |
|  | Sal | 6 |

## Electives ( 24 credits)

8 or more credits must be NAS courses; no more than 4 credits may be lower-division.

NAS 301

NAS 306
NAS 334U
NAS
335U/Eng
335U
NAS 342
NAS 348

NAS 349
NAS 399
NAS 399

NAS 399
NAS 399
NAS 410
NAS 410
NAS 410
NAS 410
NAS 410
NAS 410
NAS 410
NAS 411
NAS 417
NAS 422
NAS 424

Anth 314U
Anth 320
Anth 417
Anth 422
Anth 456
BSt 326U
ChLa 303U
ChLa 331U

ChLa 375U
Eng 309U
Hst 330U
Hst 331U

Introduction to Native American
Languages
Red Power
Topics in Film Genres and Movements
Topics in Literature and Film

Indigenous Gardens and Food Justice
Indigenous Practices for
Environmental Sustainability
Indigenous Leadership for
Sustainable Futures
Native American Music
Native American Politics \&
Activism
Queer Indigenous Studies
Urban Indians
Decolonizing via Indigenous Art
Queer Indigenous Theory,
Practice \& Fiction
Intro to Native Film

Indigenous Literature \& Cultural

## Studies

Native Spirituality
Nationhood: TribalSovereignty, 4
Governance \& Policy
Maintenance and Revitalization
of Endangered Languages
First Foods of the Pacific 4
Northwest
Cultural Ecology: Indigenous
Science and the Natural World Native Americans
Indigenous Peoples of the
Pacific Northwest Coast
Advanced Topics in Native
American Studies
Tribal Sovereignty and Policy

Management
Cuba, Dominican Republic,
Puerto Rico
Chicana/LatinaExperience
Barrio Culture: Art and
Literature
Southwestern Borderlands

| Hst 349U | United States Indian Policy <br> PHE 315 <br>  <br>  <br>  <br> Epidemic of Mis sing and <br>  <br> PHE 415 | Peoples <br> Native American Health: <br> Decolonizing Health Equity <br> Great Tribal Leaders |
| :--- | :--- | :--- |
| PS 432 | 4 |  |
| Psy 410 | Native American Ps ychological <br> Healing | 4 |
| Psy 410 | Native American Ps ychological <br> Thought and Values | 4 |
| SW 465 | Introduction to Indian Child | 4 |
| SySc 350U | Welfare and the IndianChild <br> Welfare Act <br> Indigenous and Systems | 4 |
| WS 375U | Perspectives on Sustainability <br> Topics in Sexuality Studies <br> WS 381 | Queer of Color Theorizing and <br> Perspectives |
| WS 451 | Interrupting Oppression | 4 |

Subtotal: 24
NOTE: Other variable and special topic courses with a focus on Indigenous Nations, Native Americans, and American Indians/Alaska Natives may count as electives; in these instances students should consult with an INNAS advis or for approval.

The minimum grade allowed to pass major requirements will be $1.7 \mathrm{C}-\mathrm{P} / \mathrm{NP}$ grading option are by arrangement only and subject to department approval.
Total Credit Hours: 56

## INDIGENOUS TRADITIONAL ECOLOGICAL AND CULTURAL KNOWLEDGE UNDERGRADUATE CERTIFICATE

The ITECK (Indigenous Traditional Ecological \& Cultural Knowledge) undergraduate certificate is designed to provide Native and non-Native students with a concentrated, decolonized study of Indigenous ecological epistemologies and their value within a variety of contemporary contexts. Central themes of analysis include the understanding, practice and implementation of Seventh Generation philosophy; recognizing the role of the sacred and that all land is sacred; reciprocity and interdependence; respecting cultural protocols and cultivating healthy relationships:"We are all related."; new partnership in education and land reclamation utilizing Indigenous cultural practices and holistic sustainability models; implications of ITECK on long-termland restoration and management practice and utilization of ITECK to restore the land on behalf of regional native flora and to deepen understanding, knowledge, and engagement through seasonal harvests, tending, culturally significant
programming and community engagement with tribal, urban Native, his torically marginalized, and other regional communities.

In recent years, W estern Science has "dis covered" what Indigenous People have known since Time Immemorial and Indigenous oralhis tories continue to confront and correct inaccurate and incomplete his torical accounts. Indigenous Ways of Knowing centers kinship and the reciprocal relationship between people and our environment. Through critical analysis of socially constructed narratives, the certificate will explore contemporary themes, such as community health, food sovereignty, Indigenous land management and practices, community development, resilience, and selfdetermination. Furthermore, opportunities will exist for building and streng thening equitable, long-term collaborative partnerships with Indigenous communities, NGO's, as well as local, regional and federalagencies, including an increase in paid internships and the fostering of diverse professional career pathways. In addition to theoretical work in Indigenous and Native American Studies, disciplinary foundations include community-based learning and high-impact student experiences such as collaborativeopportunities with existing community partners.

| Experiential Learning Requirements |  |  |
| :--- | :--- | :--- |
| NAS 404 | Cooperative Education/Internship | 4 |
| NAS 407 | Indigenous Ecological Healing | 4 |
|  | Practices |  |


| Subtotal: 8 |  |  |
| :---: | :---: | :---: |
| Core Requirements |  |  |
| NAS 201 | Introductionto Native American Studies | 4 |
| NAS 342 | Indigenous Gardens and Food Justice | 4 |
| NAS 348 | Indigenous Practices for EnvironmentalSustainability | 4 |
| NAS 349 | Indigenous Leadership for Sustainable Futures | 4 |
| NAS 392 | Indigenous Ways of Knowing | 4 |
| NAS 422 | First Foods of the Pacific Northwest | 4 |
| NAS 424 | Cultural Ecology: Indigenous Science and the Natural World | 4 |

Subtotal: 28

## Total Credit Hours: 36

All courses for the certificate must be passed with a C-or Pass grade.

INDIGENOUS NATIONS STUDIES MINOR

The department offers a minor that is meant to serve three primary student constituencies:

- students who have a serious academic interest in Indigenous Ways of Knowing and who wish to combine the study of Native Epistemologies with their major;
- students who plan careers in non-profit, education, social services, tribal government, and academic sectors and wish to develop a diverse eye towards working with Native/Indigenous communities;
- students who have a nascent interest in Native/Indigenous communities and wish to fulfill their generaleducation requirements with courses in this area.
The objectiveof the internship requirement is to place INST students in community or governmentorganizations so that each studenthas an opportunity to acquire understanding of Native issues.
For information and advising, contact the Program Coordinator, Josh Powell at josh @pdx.edu.


## REQUIREMENTS

## Courses

| NAS 201 | Introduction to Native A merican | 4 |
| :--- | :--- | :--- |
| NAS 404 | Studies <br> Cooperative Education/Internship | 4 |

Upper-di vision credit courses chosen from the
following (or other adviser-approved courses) 24
credits

| Anth 313U | Native American-Settler | 4 |
| :---: | :---: | :---: |
|  | Relations |  |
| Anth 314U | Native Americans | 4 |
| Anth 417 | Advanced Topics in Native | 4 |
|  | American Studies |  |
| Anth 422 | Tribal Sovereignty and Policy | 4 |
| Eng 309U | Indigenous Nations Literature | 4 |
| Hst 330U | Native Americans of Eastern | 4 |
|  | North America |  |
| Hst 331U | Native Americans of Western | 4 |
|  | North America |  |
| Hst 349U | United States Indian Policy | 4 |
| Hst 464 | Indians of the Pacific Northwest | 4 |
| NAS 301 | Introduction to Native American | 4 |
|  | Languages |  |
| NAS 306 | Red Power | 4 |
| NAS 334U | Topics in Film Genres and | 4 |
|  | Movements |  |
| NAS | Topics in Literature and Film | 4 |
| 335U/Eng |  |  |
| 335 U |  |  |
| NAS 342 | Indigenous Gardens and Food | 4 |
|  | Justice |  |

NAS 348
NAS 349
NAS 399
NAS 399
NAS 399
NAS 399
NAS 410
NAS 410
NAS 410
NAS 410
NAS 410
NAS 410
NAS 410
NAS 411 Nationhood:Tribal Sovereignty,
Governance \& Policy
NAS 417 Maintenance and Revitalization
of Endangered Languages
NAS 422
NAS 424
PHE 315
First Foods of the Pacific
Northwest
Cultural Ecology: Indigenous
Science and the Natural World
Justice in Public Health:The
Epidemic of Missing and
Murdered Indigenous Women \& Peoples
PHE 415 Native American Health: 4
PS 32 Gecolonizg Heall Equity
PS 432 Great Tribal Leaders
Psy 410 Native American Psychological 4
Healing
Psy $410 \quad$ Native American Psychological
Thoughtand Values
Introductionto Indian Child
Welfare and the Indian Child
Welfare Act
SySc 350U
Indigenous and Systems
Perspectives on Sustainability
Queer of Color Theorizing and
Perspectives
Interrupting Oppression

4

Subtotal: 28
Interdisciplinary Studies: Arts and Letters, Liberal Studies, Science, Social Science
503-725-3822
Suite 360 FariborzMaseeh Fall (FMH)

- B.A., B.S. (Arts and Letters, Liberal Studies, Science, and Social Science)
Programs which are of an interdisciplinary nature and which do not conveniently fit within the normal department areas are lis ted under Interdis ciplinary Studies and Liberal Studies.

Students interested in Interdisciplinary Studies will complete their major requirements by taking a concentration of courses in the arts and letters or science or social science academic areas. Students interested in all three categories (arts and letters, science, and social science) major in Liberal Studies by taking upper-division courses across all three categories.
Outside of the requirement that Interdisciplinary Studies and Liberal Studies students take Wr323 or a Writing Intensive Course (WIC), there are no specific courses required forthe Interdisciplinary Studies and Liberal Studies majors. To take full ad vantage of the opportunities afforded these majors, students should plan a program which includes a coherent set of courses providing an indepth study in the area of special interest as well as providing enhancement of problem-solving and communication skills.

In addition to meeting all of the non-major and general education baccalaureate degree requirements, a student in one of these majors mustcomplete 52 credits in one of the following areas: arts and letters or scienceor social science. A minimum of 32 of the 52 credits must beupperdivision with at least 8 upper-divisioncredits in each of two departments. In addition to 52 credits, all students must take Wr 323 or a Writing Intensive course for a total of 56 credits.

## Undergraduate program

For advising in these majors, pleasego to: https://www.pdx.edu/advis ing/advising-locations.

## DEGREE MAPS AND LEARNING OUTCOMES

To view the degree maps and expected learning outcomes for Interdisciplinary Studies' undergraduate degrees, go to www.pdx.edu/academic-programs/a-z.

## ADMISSION REQUIREMENTS

Admis sion to the department is based on general admis sion to the Univers ity. See Admissions Requirements (p.8) for more information.

ARTS \& LETTERS B.A./B.S.

Fora list of courses under the Arts and Letters academic distribution area, review the Requirements website (p. 33).

Courses \begin{tabular}{ll}

\& | Upper-divis ion credits fromone |
| :--- |
| departmentin the major |
| academic area | <br>

| Upper-divis ion credits froma |
| :--- |
| second department in the major |
| academic area | \& 8 <br>


| Additionalupper division credits |
| :--- |
| from any department(s) in the |
| major academic area |
| Additionalcredits in the major |
| academic area | \& 16 <br>

Wr323 \& | Writing as Critical Inquiry |
| :--- |
| or |
| WICcourse |

\end{tabular}

Courses used to satisfy the major requirements, whether taken at PSU or elsewhere, must be graded C- or above. A maximum of 12 credits may be graded P .

LIBERAL STUDIES B.A./B.S.

A student majoring in liberal studies must complete the general University requirements (except general education requirements), eitherWr323 or an approved Writing Intensive Course, and the following requirements for the liberal studies major:

## Courses

$$
\begin{aligned}
& \text { Upper-division credits fromthe } \\
& \text { arts and letters, science and/or } \\
& \text { social scienceacademic } \\
& \text { distribution areas }
\end{aligned}
$$

4 credits Wr 323, or an approved Writing Intensive Course which can be included in the 81 upper-division requirements.

Courses used to satisfy the major requirements, whether taken at PSU or elsewhere, must be graded C- or above. A maximum of 12 credits may be graded $P$.
Students majoring in Liberal Studies and also in a second major must meet the generaleducation requirement and the upper-division requirement in the academic dis tribution areas forthe second major.

SCIENCE B.A./B.S.

For a list of courses under the Science academic dis tribution area, review the Requirements website (p.33).

## Courses

| Upper-division credits fromone <br> department in the major <br> academic area | 8 |
| :--- | ---: |
| Upper-division credits froma <br> second department in the major <br> academic area | 8 |
| Additional upper division credits <br> from any department(s) in the | 16 |
| major academic area |  |
| Additionalcredits in the major |  |
| academic area |  |$\quad 20$

Courses used to satisfy the major requirements, whether taken at PSU or elsewhere, must be graded C- or above. A maximum of 12 credits may be graded $P$.

SOCIAL SCIENCE B.A./B.S.

For a list of courses under the Social Science academic distribution area, review the Requirements website (p.33).
The Social Science major requires 56 credits including: 4 credits in Wr323 or a Writing Intensivecourse; 52 credits in social science, a minimum of 32 of those credits must be upper-division with at least 8 upper-division credits in each of two departments

## Courses

Wr323

| Upper-division credits fromone <br> departmentin the major | 8 |
| :--- | :--- |
| academic area <br> Upper-division credits froma | 8 |
| second department in the major <br> academic area |  |
| Additional upper division credits <br> from any department(s) in the | 16 |
| major academic area <br> Additional credits in the major <br> academic area | 20 |
| Writing as Critical Inquiry <br> or <br> WIC course | 4 |

Subtotal: 56

Admission to the programis based on general admis sion to the University. See Admis sions Requirements (p. 8) for more information.

JUDAIC STUDIES B.A.
A bachelor's degree in Judaic Studies fromPortland State University prepares you to succeed in our interconnected world of diverse cultures and religions.
In the Harold Schnitzer Family Programin Judaic Studies, we take the 3,000-year-long his tory and culture of the Jews as our point of our departure for grappling with urgent human questions about justice and knowledge, tradition and change, and cris is and resilience. Truly interdisciplinary, the Judaic Studies majorexplores topics in history, English literature, Hebrew language, religion, and film studies.
We welcome students of all backgrounds who seek an intensive liberal arts experience. Our faculty offer close mentoring to support your success. Our partnerships provide opportunities for internships, study abroad and scholarships.
Students pursuing the major in Judaic Studies gain broad exposure to the study of Jews and Judaismin multiple historical and geographical contexts, fromancient Is rael to 21st-century America. Through a combination of courses, lectures, research symposia, scholarly conferences, and cultural events, you will gain a unique insight into the roles of religion and culture in society. We offer:

- An Intimate Learning Environment: You'llenjoy small classes taught by our scholar-teachers who foster the kind of close-knit academic community usually as sociated with small liberal arts colleges, allnestled within a major urban university.
- Exciting Opportunities for Study Abroad in Is rael: The Lorry I. Lokey Endowed Fund for Is rael Scholarship provides up to $\$ 5,000$ annually for a Judaic Studies major to travelto and study abroad in Israel.
- Funded Internships at Local Community Organizations: The Sara Glas gow Cogan Memorial Internship provides you with the opportunity to gain real-world experience with community partners.
- Generous Scholarships: We offer several scholarships for students majoring in Judaic Studies, from $\$ 500$ to \$7,000 annually.

Graduates with a bachelor's degree in Judaic Studies go on to fulfilling professions in education, community and social services, the rabbinate and ministry, research, the arts, marketing, consulting, and law. You will develop marketable skills perennially relevant in the future of work:

- Critical thinking and problem-solving
- Ability to communicate ideas clearly and compellingly
- Cultural intelligence and global perspective
- Analytical acumen
- Leadership, empathy, and collaboration


## DEGREE REQUIREMENTS

Requirements for major. In addition to meeting the general University degree requirements, the major in Judaic Studies mustmeet the departmental requirements listed.

## Upper-Division Courses

At least 12 of the upper division credits must be comprised of Judaic Studies programcourses in one of the following areas:

## Area A: Jews in Antiquity

JSt 311/Hst Introduction to the New 4
311 Testament
JSt Jewish History fromAntiquity to
317U/Hst the Medieval Period
317 U
JSt Rabbinic Culture in the Roman
319U/Hst
319U
JSt 324U Historical Introduction to the
Hebrew Bible/Old Testament
Retelling the Bible
JSt Pagans, Christians and Jews
378U/Hst
378U
Area I: Israel Studies

| Eng 330U | Jewish and Is raeli Literature | 4 |
| :--- | :--- | :--- |
| Hst 494 | Public History Seminar: | 4 |
|  | Museums and Memory |  |
| JSt 333U | Israeli Culture and Society | 4 |
| JSt 335U | Sex, Love, and Gender in Is rael | 4 |
| JSt | History of Zionism | 4 |
| 379U/Hst |  |  |
| 379U |  |  |
| JSt 388U | History of Modern Israel | 4 |
| JSt 435 | Jewish and Israeli Dance His tory | 4 |


| Area J: Judaism |  |  |
| :--- | :--- | :--- |
| JSt | Rabbinic Culture in the Roman | 4 |
| 319U/Hst | World |  |
| 319U |  | 4 |
| JSt 324U | Historical Introduction to the | 4 |
|  | Hebrew Bible/Old Testament  <br> JSt 325U Retelling the Bible | 4 |
| JSt | Kabbalah:The JewishMystical | 4 |
| 381U/Hst | Tradition |  |
| 381U |  |  |


| Area L: Literature, Culture, and the Arts |  |  |
| :---: | :---: | :---: |
| Eng 330U | Jewish and Is raeli Literature | 4 |
| FILM 384U | Topics in American Cinema and Culture: American Jewish Experience | 4 |
| FILM 384U | Topics in American Cinema and Culture: Mamet | 4 |
| JSt 311/Hst | Introduction to the New | 4 |
| 311 | Testament |  |
| JSt | Rabbinic Culture in the Roman | 4 |
| 319U/Hst | World |  |
| 319 U |  |  |
| JSt 324U | Historical Introduction to the | 4 |
|  | Hebrew Bible/Old Testament |  |
| JSt 325U | Retelling the Bible | 4 |
| JSt 333U | Is raeli Culture and Society | 4 |
| JSt 431 | The Arts and the Jewish | 4 |
|  | Experience |  |
| JSt 435 | Jewish and Israeli Dance History | 4 |
| Area M: Modern Jewish History |  |  |
| FILM 384U | Topics in American Cinema and | 4 |
|  | Culture: American Jewish |  |
|  | Experience |  |
| JSt | Jewish History fromthe | 4 |
| 318U/Hst | MedievalPeriod to thePresent |  |
| 318 U |  |  |
| JSt 335U | Sex, Love, and Gender in Israel | 4 |
| JSt 372/Hst | His tory of Antisemitism | 4 |
| 372 |  |  |
| JSt | History of Zionism | 4 |
| 379U/Hst |  |  |
| 379 U |  |  |
| JSt | The Holocaust | 4 |
| 380U/Hst |  |  |
| 380U |  |  |
| JSt 388U | History of Modern Is rael | 4 |
| JSt 435 | Jewish and Israeli Dance History | 4 |

JSt 399 Topics in Jewish Studies (1-4) Area: varies depending on topic.

JSt 401 Research Project (1-8) Area: varies depending on topic.
JSt 407 Seminar in Jewish Studies (1-4) Area: varies depending on topic.
JSt 409 Practicum(1-8) Area: varies depending on topic.
JSt 410 Selected Topics (1-4) Area: varies depending on topic.

Approved courses on the 400 level or higher (Eng 410, JSt 430, Hst 405, 407, 461, 561, etc.): varies depending on topic.

| Courses: |  |  |
| :---: | :---: | :---: |
| JSt | Jewish History fromAntiquity to | 4 |
| 317U/Hst | the Medieval Period |  |
| 317 U |  |  |
| JSt | Jewish History fromthe | 4 |
| $\begin{aligned} & \text { 318U/Hst } \\ & 318 \mathrm{U} \end{aligned}$ | MedievalPeriod to thePresent |  |
| Heb 203 | Second-Year Modern Hebrew | 4 |
|  | Term 3 |  |
| JSt 407 | Seminar | 4 |
|  | 4 credits of JSt 402, JSt 405 or | 4 |
|  | JSt 409 |  |
|  | 32 credits of upper-division JSt | 32 |
|  | courses or instructor approved equivalents (including FILM |  |
|  | 384U American Jewish |  |
|  | Experience). Up to 12 credits of |  |
|  | Hebrew 301 or highermay be counted as electivecredits |  |
|  | towards this total. Up to 4 credits |  |
|  | may be JST 200-level courses. |  |
|  | Up to 4 credits may consist of |  |
|  | approved upper-division subject |  |
|  | area outside of the Judaic |  |
|  | Studies Program. |  |

Total Credit Hours: 52

## JUDAIC STUDIES MINOR

Portland State University offers a comprehensive yet flexible undergraduate minor in Judaic Studies. Students completing the minor will have gained exposure to the study of Jewish history and culture in a variety of national and international contexts ranging fromantiquity until the present day. Students completing the minor will choose from courses taught by the core faculty of the Judaic Studies program which focus on the Jews of the ancient Mediterranean, modern Europe, Is rael and the United States. Through exploration of Jewish culture, Jewish contributions to other cultures, and the impact of modernity on national, ethnic, and religious identity, students will have broadened and deepened their education, better preparing themfor our interconnected world of diverse cultures and religions.
Students undertaking the minor in Judaic Studies at PSU may be eligible for the Sara Glas gow Cogan Memorial Scholarship and the Abigail Jacobs-Kaufman Scholarship.

## REQUIREMENTS

To earn a minor in Judaic Studies a student must complete 28 credits in courses taught by the core faculty of the Judaic Studies programor their equivalents, at least 16 credits of which must be upper-division courses, and at least 12 credits of which must be taken in residence at PSU. Students may include up to 4 credits of coursework
taughtby faculty fromoutside the Judaic Studies program but which has a conceptual, topical, or methodological relevance to the discipline of Judaic studies. Up to 8 credits of Heb 203 or higher may also be applied.
For more information about specialby-arrangement courses, and for-credit academic internship opportunities with local cultural and community institutions such as the Oregon Jewish Museum, contact the programadvisor.

## Courses approved for the minor:

JSt 311/Hst Introduction to the New
311 Testament
JSt
317U/Hst
317U
JSt
318U/Hst
318U
JSt
319U/Hst
319U
JSt 324U
JSt 325U
JSt 333U
JSt 335U
JSt 372/Hst
372
JSt
378U/Hst
378U
JSt
379U/Hst
379U
JSt
380U/Hst
380U
JSt
381U/Hst
381U
JSt 388U
JSt 399
JSt 401
JSt 402
JSt 404
JSt 405
JSt 407
JSt 430

| Eng 330U | Jewish and Israeli Literature |
| :--- | :--- |
| FILM 384U | Topics in American Cinema and |
|  | Culture: Mamet |

Hst 461 Topics in Jewish History 4
Hst 491 Reading Seminar 4
Hst 494 Public History Seminar: 4
Museums and Memory
JSt 201 Introductionto Judaism

His torical Introduction to the Hebrew Bible/Old Testament Retelling the Bible

History of Modern Is rael 4
SpecialStudies 1-4
Research 0-6
Independent Study 1-12
CooperativeEd/Internship 1-12
Reading and Conference 0-6
Seminar 1-4
Messiahs and Messianism 4

JSt 431
JSt 435

## Fariborz Maseeh Department of Mathematics + Statistics

460 Fariborz Maseeh Hall (FMH)
503-725-3621
www.pdx.edu/math/

- B.A., B.S. in Mathematics
- B.S. in Data Science
- 4+1 Program: B.S., B.A. Mathematics + MS Economics
- Minor in Mathematics
- Minor in Mathematics for Middle School Teachers
- Mathematics forTeaching License Requirements
- Graduate Certificate for Middle School Mathematics Teachers
- Graduate Certificate in Applied Statistics
- M.A., M.S. in Mathematics
- M.S.in Statistics
- M.S. in Mathematics for Teachers
- Ph.D. in MathematicalSciences
- Ph.D. in Mathematics Education


## Undergraduate programs

The mathematical sciences have long provided the proper language of the physical sciences and engineering, and they are playing an increasingly important role in areas as diverse as data science, computer science, the social sciences, business administration andeconomics, and the biological and medical sciences. Many are drawn to the study of mathematics and statistics precisely because of this broad applicability. Others are attracted by the rigorous training these disciplines provide in abstract reas oning, and the many surprising results and eleg ant arguments they encounter. The department offers a wide variety of courses in mathematics and statistics to meet the needs of a student body having very diverse interests. Anyone who would like to learn more about the department's faculty, programs, courses, activities and other services is encouraged to explore the department website, or vis it the department office.

## DEGREE MAPS AND LEARNING OUTCOMES

To view the degree maps and expected learning outcomes for undergraduate degrees in mathematics and data science,
go to https://www.pdx.edu/math/bachelor-attsbachelor-science-mathematics and
https://www.pdx.edu/math/bachelor-science-data-science.

## ADMISSION REQUIREMENTS

In order to help students plan their programs, the Fariborz MaseehDepartment of Mathematics and Statistics provides placement assistance and the opportunity to meet with a faculty adviser. All students are urged to avail themselves of these services, especially those students who are enrolling in their first mathematics or statistics courses.
Students interested in majoring in mathematics and/or data science are urged to meet with a departmental adviser.
Students who have decided to major in mathematics and/or data science should informboth the department and the registrar's office of that decision. Mathematics and data science majors are encouraged to participate in the activities of the department and to meet on a regular and continuing basis with a departmental adviser.

## MATHEMATICS B.A./B.S.

The degree programrequires a basic core of courses (44 credits) and elective courses ( $18-21$ credits). This structure gives flexibility to the program that allows students to pursue special areas of interest in mathematics. The programis designed to provide a foundation for more advanced work and/or a basis foremployment in business, government, industry, or secondary education.

## REQUIREMENTS

In addition to meeting the general University degree requirements, the major in mathematics must complete the following requirements:

## Courses

Mth 251
Mth 252
Mth 253
Mth 261
Mth 254
Mth 255
Mth 256

Mth 271 Mathematical Computing
or
CS 161 Introduction to Programming and Problem-Solving

Mth 311 Introduction to Mathematical Analysis I
Mth 312 Introductionto Mathematical Analysis II

Mth 344 Introductionto Group Theory and Applications

## Additional Requirements chosen from Approved List

 of courses-sequences| Mth/Stat | Approved two-term400-level <br> (one) | 6 |
| :--- | :--- | ---: |
| Mth/Stat | Mth or Stat sequence <br> Approved 400-levelMth orStat | $6-7$ |
| (two) | courses |  |
| Mth/Stat | Approved 300- or 400-level Mth <br> (two) | or Stat courses |

Total Credit Hours: 62-65
Approved electives are:
Mth 300
Introductionto Mathematical
Reasoning
Mth 313 Advanced Multivariate Calculus 4
Mth 322 Applied PartialDifferential 4
Equations
Mth 338
Mth 343
Vector Analysis
Modern College Geometry
Applied Linear Algebra
Introductionto Ring and Field Theory
Mth 346
Number Theory
Mth 356 Discrete Mathematics
Mth 371
Mth 411
Large-Scale Data Algorithms
Introduction to Real Analysis I
Introduction to Real Analysis II
$\begin{array}{ll}\text { Mth 413 } & \text { Introduction to Real Analysis III } \\ \text { Mth 420 } & \text { Introductionto Complexity }\end{array}$ Theory
Mth 421 Theory of Ordinary Differential Equations I
Mth 422 Theory of Ordinary Differential Equations II
Mth 423 Theory of Ordinary Differential 3
Equations III
Mth 424
Mth 425
Mth 427
Mth 428
Mth 430
Mth 431
Mth 432
Mth 433
Mth 434
Mth 435
Mth 436
Mth 441
Mth 442
I

II
II

| Mth 443 | Introduction to Abstract Algebra III |
| :---: | :---: |
| Mth 444 | Advanced Linear/Multilinear |
|  | Algebra I |
| Mth 445 | Advanced Linear/Multilinear |
|  | Algebra II |
| Mth 449 | Topics in Advanced Number |
|  | Theory |
| Mth 451 | Numerical Calculus I |
| Mth 452 | Numerical Calculus II |
| Mth 453 | Numerical Calculus III |
| Mth 456 | Topics in Combinatorics |
| Mth 457 | The Mathematical Theory of |
| Mth 458 | The Mathematical Theory of |
|  | Games II |
| Mth 461 | Graph Theory I |
| Mth 462 | Graph Theory II |
| Mth 464 | Numerical Optimization I |
| Mth 465 | Numerical Optimization II |
| Mth 470 | Complex Analysis and Boundary |
|  | Value Problems I |
| Mth 471 | Complex Analysis and Boundary |
|  | Value Problems II |
| Mth 472 | Complex Analysis and Boundary |
|  | Value Problems III |
| Mth 477 | Mathematical Control Theory I |
| Mth 478 | Mathematical Control Theory II |
| Mth 481 | Topics in Probability for |
|  | Mathematics Teachers |
| Mth 482 | Topics in Statistics for |
|  | Mathematics Teachers |
| Mth 483 | Topics in Geometry for |
|  | Mathematics Teachers |
| Mth 484 | Topics in Algebrafor |
|  | Mathematics Teachers |
| Mth 485 | Topics in Analysis for |
|  | Mathematics Teachers |
| Mth 486 | Topics in The History of |
|  | Mathematics |
| Mth 487 | Topics in Discrete Mathematics for Mathematics Teachers |
| Mth 488 | Topics in Computing for |
|  | Mathematics Teachers |
| Stat 361 | Introduction to Statistical |
|  | Methods |
| Stat 363 | Statistical Computing and Data |
|  | Visualization in R |
| Stat 364 | Modern Regression Analysis |
| Stat 387 | Introduction to Statistical |
|  | Learning |
| Stat 451 | Applied Statistics for Engineers and Scientists I |
| Stat 452 | Applied Statistics for Engineers and Scientis ts II |


| Stat 461 | Introductionto Mathematical | 3 |
| :---: | :---: | :---: |
|  | Statistics I |  |
| Stat 462 | Introductionto Mathematical | 3 |
|  | Statistics II |  |
| Stat 463 | Introduction to Mathematical | 3 |
|  | Statistics III |  |
| Stat 464 | Applied Regression Analysis | 3 |
| Stat 465 | Experimental Design: Theory and Methods I | 3 |
| Stat 466 | Experimental Design:Theory and Methods II | 3 |
| Stat 467 | Applied Probability I | 3 |
| Stat 468 | Applied Probability II | 3 |

Check with the department for the list of approved Mth or Stat sequences and for additional courses, including omnibus-numbered courses, which may be approved as electives.

All courses used to satisfy the mathematical major requirements, whether taken in the department or else where, must be graded $\mathrm{C}-, \mathrm{P}$, or above, but no more than 4 courses graded $P$ will count toward these requirements. Transfer students majoring in mathematics are required to take a minimum of 15 credits of PSU upper-division mathematics or statis tics courses in residence.

## M ATHEM ATICS B.A./B.S. OPTIONS

In addition to the specific required courses (p. 292), the following options are intended to help the student plan a programof study with a specific goal or career in mind.
Option I—Applied Mathematics
Recommended electives:

| Mth 322 | Applied Partial Differential Equations | 4 |
| :---: | :---: | :---: |
| Mth 343 | Applied Linear Algebra | 4 |
| Mth 371 | Large-Scale Data Algorithms | 4 |
| Mth 421 | Theory of Ordinary Differential EquationsI | 3 |
| Mth 422 | Theory of Ordinary Differential Equations II | 3 |
| Mth 424 | Elementary Differential Geometry I | 3 |
| Mth 425 | Elementary Differential Geometry II | 3 |
| Mth 427 | Partial Differential Equations I | 3 |
| Mth 428 | Partial Differential Equations II | 3 |
| Mth 430 | Topics in Mathematical Modeling | 3 |
| Mth 451 | Numerical Calculus I | 3 |
| Mth 452 | Numerical Calculus II | 3 |
| Mth 457 | The Mathematical Theory of Games I | 3 |
| Mth 458 | The Mathematical Theory of Games II | 3 |


| Mth 464 | Numerical Optimization I | 3 |
| :---: | :---: | :---: |
| Mth 465 | Numerical Optimization II | 3 |
| Mth 470 | Complex Analysis and Boundary Value Problems I | 3 |
| Mth 477 | Mathematical Control Theory I | 3 |
| Mth 478 | Mathematical Control Theory II | 3 |
| Option II-Graduate School Preparation |  |  |
| Recommended electives: |  |  |
| Mth 411 | Introduction to Real Analysis I | 3 |
| Mth 412 | Introduction to Real Analysis II | 3 |
| Mth 413 | Introduction to Real Analysis III | 3 |
| Mth 434 | Set Theory and Topology I | 3 |
| Mth 435 | Set Theory and Topology II | 3 |
| Mth 436 | Set Theory and Topology III | 3 |
| Mth 441 | Introduction to Abstract Algebra I | 3 |
| Mth 442 | Introduction to Abstract Algebra II | 3 |
| Mth 443 | Introduction to Abstract Algebra III | 3 |
| Option III-Statistics |  |  |
| Recommended electives: |  |  |
| Stat 361 | Introduction to Statistical Methods | 4 |
| Stat 363 | Statistical Computing and Data Visualization in R | 4 |
| Stat 364 | Modern Regression Analysis | 4 |
| Stat 387 | Introductionto Statistical Learning | 4 |
| Stat 461 | Introduction to Mathematical Statistics I | 3 |
| Stat 462 | Introduction to Mathematical Statistics II | 3 |
| Stat 463 | Introduction to Mathematical Statistics III | 3 |
| Stat 464 | Applied Regression Analysis | 3 |
| Stat 465 | Experimental Design:Theory and Methods I | 3 |
| Stat 466 | Experimental Design:Theory and Methods II | 3 |
| Stat 467 | Applied Probability I | 3 |
| Stat 468 | Applied Probability II | 3 |
| Option IV--High School Teaching |  |  |
| Recommended electives: |  |  |
| Mth 338 | Modern College Geometry | 4 |
| Mth 346 | Number Theory | 4 |
| Mth 356 | Discrete Mathematics | 4 |
| Mth 486 | Topics in The History of Mathematics | 3 |
| Mth 488 | Topics in Computing for Mathematics Teachers | 3 |
| Stat 461 | Introduction to Mathematical Statistics I | 3 |

Stat 462 Introduction to Mathematical Statistics II

See also the Mathematics Licensure section.
Option V—Actuarial Science
Recommended electives:

| Mth 271 | Mathematical Computing | 4 |
| :---: | :---: | :---: |
| Mth 451 | Numerical Calculus I |  |
| Mth 452 | Numerical Calculus II | 3 |
| Stat 451 | Applied Statistics for Engineers and Scientists I | 4 |
| Stat 461 | Introduction to Mathematical Statistics I | 3 |
| Stat 462 | Introduction to Mathematical Statistics II | 3 |
| Stat 463 | Introduction to Mathematical Statistics III | 3 |
| Stat 464 | Applied Regression Analysis | 3 |
| Stat 465 | Experimental Design:Theory and Methods I | 3 |
| Stat 466 | Experimental Design:Theory and Methods II | 3 |
| Stat 467 | Applied Probability I | 3 |
| Stat 468 | Applied Probability II | 3 |
| M ATHEM ATICS AND STATISTICS HONORS TRACK |  |  |

The Honors Track in Mathematics and Statistics offers an
opportunity for outstanding mathematics majors to engage
in independent research under the supervision of a faculty
member. Students who successfully complete the honors
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The Honors Track in Mathematics and Statistics offers an
opportunity for outstanding mathematics majors to engage
in independent research under the supervision of a faculty
member. Students who successfully complete the honors track will receive notice of this distinction on their academic transcripts and on their diplomas.
The requirements for admis sion to the Mathematics and Statistics Honors Track are:

1. Completion of 12 credits in the Fariborz Maseeh

Department of Mathematics and Statistics, 4 of which should be at a 300-level or above;
2. A minimum cumulative GPA of 3.5 points and a
minimum GPA of 3.67 points in the mathematics major;
3. A complete application formsubmitted to the Fariborz MaseehDepartment of Mathematics and Statistics no later than three quarters before graduation.

## Requirements

The Mathematics and Statistics Honors Track requirements for graduation are:

Mth 251
Calculus I
4
Mth $252 \quad$ Calculus II 4
Mth 253 Calculus III 4
Mth 254

## M ATHEM ATICS AND STATISTICS HONORS

 TRACK
## Courses

| Mth 255 | Calculus V |
| :--- | :--- |
| Mth 261 | Introduction to Linear Algebra |
| Mth 256 | Applied Ordinary Differential <br> Equations |
| Mth 311 | Introduction to Mathematical <br>  <br> Analysis I |
| Mth 312 | Introduction to Mathematical <br> Analysis II |
| Mth 344 | Introductionto Group Theory <br> and Applications |
| Mth 401 | Honors Project |
| Mth 271 | Mathematical Computing <br> or |
| CS 161 | Introductionto Programming and <br> Problem-Solving |

## Additional Requirements chosen from Approved List of courses-sequences

| Mth/Stat <br> (two) | Approved 400-level sequences | 12 |
| :--- | :--- | ---: |
| Mth/Stat <br> (one) | Approved 300- or 400-level <br> elective course | $3-4$ |

The undergraduate adviser, in consultation with faculty, will as sign the students a faculty honors project adviser to guide their research. The research topic will be at a 400level or above and will not havebeen discussed or presented in courses the students have taken. Concluding the work, the students will give an oral presentation of the honors project to faculty and students.

Students must have a cumulative GPA no lower than 3.5 points and a GPA no lower than 3.67 points in the major.
No mathematics orstatistics courses taken under the undifferentiated grading option are acceptable towards fulfilling the requirements for the Mathematics and Statistics Honors Track. Transfer students majoring in mathematics are required to take a minimum of 15 credits of PSU upper-division mathematics or statistics courses in residence.

The department chair and an undergraduate adviser will monitor the progress of the students accepted in the Mathematics and Statistics Honors Track. If this progress and/or performance are found to be unsatis factory and if corrective actions cannot be identified, the students will be dropped fromthe Mathematics and Statistics Honors Track (the students may optout to pursue a regular mathematics major or to select another major).

## University Honors College Students

Students in the University Honors College majoring in mathematics have two options for completing their Honors thesis project:
Option 1: Apply to join the Mathematics Departmental Honors Track program, complete the required coursework, and registerfor Hon 403: Thes is Prospectus ( 4 credits) in
the quarter immediately preceding the Mth 401: Honors Project ( 3 credits). During the thesis prospectus course students will work with their mathematics honors project adviser in the department of Mathematics and Statistics to identify a research question and topic, which they will then carry out during the quarter they are registered for Mth 401. Univers ity Honors College will accept the Mth 401 credits in lieu of additional Hon 403 thesis credits. The Mth 401 research project will fulfill the honors thesis requirement. (Students are permitted to register for Hon 403: Thesis Continuation credits if they would prefer additional support orcredit hours.) Students are required to give an oral presentation of their completed research projects to faculty and students in the Mathematics and Statistics department as well as at the Honors Thesis symposiumfor Univers ity Honors College faculty and students. Students earn both Mathematics Departmental Honors and University Honors.

Option 2: University Honors College students who do not meet the minimum requirements or who choose not to join the Mathematics Departmental Honors Track program must still fulfill the requirements of two approved 400 level sequences in mathematics and/or statistics. They are then eligible to proceed with the mathematics honors research project, taking Hon 403: Thes is Prospectus and then Mth 401: Honors Project under the supervision of a Mathematics and Statistics faculty adviser. Students earn University Honors but not Departmental Honors. Subtotal: 62-63

## B.S. IN DATA SCIENCE

The degree programrequires a basic core of courses (61 credits) and elective courses (12-15 credits). This structure gives flexibility to the programthat allows students to pursue special areas of interest in applications of data science. The programis designed to provide a found ation for more advanced work and/or a basis for employment in business, industry, and government.

## REQUIREMENTS

In addition to meeting the general University degree requirements, the major in data science must complete the following requirements.

## Courses

Mth 231 Data Science Seminar 2
Mth $251 \quad 4$
Mth 252 Calculus II 4
Mth 253 Calculus III 4
Mth 261 Introductionto Linear Algebra 4
Mth 271 Mathematical Computing 4
CS 161 Introductionto Programming and 4 Problem-Solving

| Mth 343 | Applied Linear Algebra |
| :---: | :---: |
| Mth 371 | Large-Scale Data Algorithms |
| Stat 361 | Introduction to Statistical |
|  | Methods |
| Stat 363 | Statistical Computing and Data |
|  | Visualization in R |
| Stat 364 | Modern Regression Analysis |
| Stat 387 | Introduction to Statistical |
|  | Learning |
| Stat 409 | Data Science Practicum |
| CS 250 | Discrete Structures I |
| CS 350 | Algorithms and Complexity |
| CS 486 | Introduction to Database |
|  | ManagementSystems |
| Additional requirements chosen fromapproved list of electives |  |
| Mth/Stat (two) | Approved 400-levelMth or Stat courses |
| Other (two) | Approved 300- or 400-level |

Check with the department for the list of additional courses, including omnibus-numbered courses, which may be approved as electives.

| Approved Mth/Stat Electives are: |  |  |
| :---: | :---: | :---: |
| Mth 451 | Numerical Calculus I | 3 |
| Mth 452 | Numerical Calculus II | 3 |
| Mth 453 | Numerical Calculus III | 3 |
| Mth 461 | Graph Theory I | 3 |
| Mth 462 | Graph Theory II | 3 |
| Mth 464 | Numerical Optimization I | 3 |
| Mth 465 | Numerical Optimization II | 3 |
| Stat 451 | Applied Statistics for Engineers and Scientists I | 4 |
| Stat 452 | Applied Statistics for Engineers and Scientis ts II | 3 |
| Stat 461 | Introduction to Mathematical Statistics I | 3 |
| Stat 462 | Introduction to Mathematical Statistics II | 3 |
| Approved electives from other disciplines are: |  |  |
| Actg 335 | Accounting Information Sy stems and Analytic Fundamentals | 4 |
| CS 430P | Internet, Web, \& Cloud Systems | 4 |
| CS 441 | Artificial Intelligence | 4 |
| CS 445 | Machine Learning | 4 |
| G 324 | Data Managementand Analy sis | 5 |
| GSCM 412 | Introduction to Enterprise | 4 |
|  | Resource Planning Sy stems |  |
| BTA 481 | Blockchain Fundamentals | 4 |
| Mgmt 442 | Human Resources Information | 4 |
|  | Systems \& People Analytics |  |
| PHE 350 | Health and Health Systems | 4 |
| PHE 427 | Introduction to Health | 4 |
|  | Informatics |  |


| PHE 450 | Epidemiology | 4 |
| :--- | :--- | :--- |
| Phl 314U | Computer Ethics | 4 |
| SySc 336U | Networks and Society | 4 |
| SySc 440 | Introduction to Network Science | 4 |

## Total Credit Hours: 73-76

All courses used to satisfy the data science major requirements, whether taken in the department or else where, must be graded $\mathrm{C}-, \mathrm{P}$, or above, but no more than 4 courses graded $P$ will count toward these requirements. Transfer students majoring in data science are required to take a minimum of 15 credits of PSU upper-division mathematics or statis tics courses in residence.

## 4+1 PROGRAM: BS/BA MATHEMATICS + MS ECONOMICS

The FariborzMaseeh Department of Mathematics \& Statistics and the Department of Economics offer an integrated "BS/BA in Mathematics and MS in Economics" degree program. High achieving mathematics undergraduate students may seamlessly enter the Master's programin Economics.

## Increased Career \& Educational Opportunities

Students pursuing a BA/BS degree in Mathematics will be exceptionally well prepared for a mathematically oriented MS programin Economics. This 4+1 program will open up more career opportunities in both public and private sector institutions, which may include state and federal governments; bank, ins urance, and financial institutions; environmental/labor organizations and NGOs; energy, law, and tech firms; and so on.

The MS programin Economics is thoroughly mathematical, allowing Mathematics majors to apply their mathematical/programming skills to solve various economic problems. Students can choose to develop themselves as a researcher of pure mathematical economic theory or as a public policy expert who specializes on is sues relevant for our day-to-day life.
The BS/BA in Mathematics + MS in Economics program also increas es the likelihood of being accepted to a PhD in Economics programby ensuring students have a strong mathematical background.

## Admissions Criteria and Process

- Mathematics majors interested in the 4+1 program should meet with their Mathematics faculty ad viser by the end of their second year to map out the required coursework for their junior and senior years.
- After completion of the junior year, students should apply for the MS programin Economics online. The student will be notified by the Graduate School if the application is successful. Applicants do not have to submit a statement of purpose or letters of
recommendation provided they satisfy theGPA requirements outlined below.
- Students should complete their degree in Mathematics, or, at the minimum, all the courses outlined in the degree map up to the winter term of the fourth year of their study schedule.
- A GPA of 3.4 or above is required for all Mathematics and Statistics clas ses taken prior to entry into the MS programin Economics.
- All courses numbered 500 and above taken prior to entry into the master's degree programin Economics must receive a grade of B or better. All undergraduate classes mustreceive a grade of C- or better. No P/NP credit will be accepted for either program.
- The PSU institutional requirement for residency for the undergraduate program is that 45 of the last 60 credits must be taken in residence at PSU. All MS level classes must be taken at PSU.


## Continuation Criteria

Students must maintain the following GPAs:

- 3.3 GPA in courses numbered 500 and above, with a minimum grade of $B$
- 3.5 GPA in economics courses numbered 499 and below, with a minimum grade of C -
- 3.3 GPA overall at PSU


## SharedCredits

Students may share up to 20 credits between the BA/BS in Mathematics and theMS in Economics program.

## Advising

Initially, students will be advised by the undergraduate adviser, in consultation with the graduate adviser, who will assistthemin preparing their application for the MS programin Economics. Once students havebegun the master's theory sequence, they will be advised by the graduate adviser.

## MATHEMATICS MINOR

Mathematics is one of the original liberal arts. For centuries, since the time of Plato's Academy, the study of mathematics has been one of the hallmarks of being well educated. The skills that are learned in mathematics and statistics classes are especially valued in today's world. Whether a student's program is philosophy, business, fine art, physics, or engineering, it will be more valuable if a strong programin mathematics and statistics accompanies it.

## REQUIREMENTS

A student must complete the following program(3 upperdivision courses mustbe taken in residence at PSU):

## Courses

Mth 251 Calculus I 4
Mth $252 \quad$ Calculus II 4
Mth 253 Calculus III 4
Mth 261 Introduction to Linear Algebra 4
Mth 254 Calculus IV 4
Mth 311 Introduction to Mathematical 4 Analysis I
or
Mth 344 Introduction to Group Theory 4 and Applications

## Additional Requirements chosen from Approved List of courses-sequences

| Mth/Stat <br> (three) | Approved elective courses not <br> used in the above requirement | $9-12$ |
| :--- | :--- | :--- |

Total Credit Hours: 33-36
Approved electives for the Minor in Mathematics are:
Mth 255 Calculus V 4

Mth 256 Applied Ordinary Differential 4 Equations
Mth 311 Introduction to Mathematical 4 Analysis I
Mth 312 Introduction to Mathematical 4
Analysis II
Mth 344 Introductionto Group Theory 4 and Applications
Stat $351 \quad$ Probability and Statistics for Electrical and Computer Engineering
or any course approved as an elective for major credit.
Only grades of $\mathrm{C}-\mathrm{P}$, or above count toward satisfying the department minor requirements. No more than three courses with a grade of P may be counted toward these requirements.

## MATHEMATICS FOR MIDDLE SCHOOL TEACHERS MINOR

This mathematics minor is intended for those who plan to enter a Graduate Teacher Education Programand be licensed in middle school mathematics (grades 5-9).

## REQUIREMENTS

A student must complete the following program ( 12 credits must be upper-division; 9 of these 12 upper-division credits must be taken in residence at PSU):

| Courses |  |  |
| :---: | :---: | :---: |
| Mth 211 | Foundations Of Elementary Mathematics I | 4 |
| Mth 212 | Foundations Of Elementary Mathematics II | 4 |
| Mth 213 | Foundations Of Elementary Mathematics III | 4 |
| Mth 491 | Experimental Probability and Statistics for Middle School Teachers | 4 |
| Mth 493 | Geometry for Middle School Teachers | 4 |
| Mth 494 | Arithmetic and Algebraic Structures for Middle School Teachers | 4 |
| Mth 495 | Historical Topics in Mathematics for Middle School Teachers | 4 |
| Mth 496 | Concepts of Calculus for Middle SchoolTeachers | 4 |
| Mth 497 | Mathematics in the Middle SchoolClassroom | 4 |
| Total Credit Hours: 36 |  |  |
| Only grades of C-, P , or above count toward satisfying the department minor requirements. No more than three courses with a grade of P may be counted toward these requirements. The prerequisites for the MTH 490's courses are MTH 111-112 and MTH 211-212-213. |  |  |
| Students who are interested in this programand who already have a Bachelors degree should look at the companion programfor graduate students, the Graduate Certificate in Mathematics for Middle School Teachers. PSU does not allow adding a minor after the Bachelor's degree has been conferred. |  |  |
| MATHEMATICS FOR TEACHING LICENSE REQUIREMENTS |  |  |
| To receive a teaching license fromPSU, after completing a baccalaureate degree a student must complete the Graduate TeacherEducation Program(GTEP) (p. 150) through the College of Education. |  |  |
| Below is a list of the minimal mathematics/statistics coursework required for individuals needing a Departmental Recommendation to enter the Graduate TeacherEducation Program(GTEP) in Advanced Mathematics and in Foundational Mathematics. |  |  |

## SECONDARY EDUCATION PROGRAM REQUIREMENTS FOR THE ADVANCED MATHEM ATICS

The programmust include the following courses or approved substitutions required by the Fariborz Maseeh Department of Mathematics and Statistics (12 courses).

| Courses |  |  |
| :--- | :--- | ---: |
| Mth 251 | Calculus I | 4 |
| Mth 252 | Calculus II | 4 |
| Mth 253 | Calculus III | 4 |
| Mth 254 | Calculus IV | 4 |
| Mth 261 | Introduction to Linear Algebra | 4 |
| Mth 271 | Mathematical Computing <br> or | 4 |
| CS 161 | Introduction to Programming and | 4 |
| Mth 338 | Modern College Geometry | 4 |
| Mth 344 | Introduction to Group Theory <br> and Applications | 4 |
| Mth 346 356 | Number Theory <br> Discrete Mathematics | 4 |
| Mth 481 | Topics in Probability for <br> Mathematics Teachers | 4 |
| Mth 482 | or <br> Topics in Statistics for <br> Mathematics Teachers | 3 |
| Stat 451 461 | or | Applied Statistics for Engineers <br> and Scientists I <br> or <br> Introductionto Mathematical |
| Statistics I <br> or | 4 |  |
| Eectives | Introductionto Mathematical <br> Statistics II | 3 |

At least one approved upper division mathematics elective. Approved courses include but are not limited to:
Mth 311 Introduction to Mathematical
Analysis I
Mth 345 Introduction to Ring and Field
Theory
Mth 481 Topics in Probability for 3
Mathematics Teachers
or
Mth 482 Topics in Statistics for

Mathematics Teachers
or

| Stat 452 | Applied Statistics for Engineers and Scientists II | 3 |
| :---: | :---: | :---: |
| Mth 483 | Topics in Geometry for Mathematics Teachers | 3 |
| Mth 484 | Topics in Algebrafor Mathematics Teachers | 3 |
| Mth 486 | Topics in The History of Mathematics | 3 |
| Mth 487 | Topics in Discrete Mathematics for Mathematics Teachers | 3 |
| Mth 488 | Topics in Computing for Mathematics Teachers | 3 |
| PROGRAM REQUIREMENTS FOR THE FOUNDATIONAL M ATHEM ATICS (TEACHING GRADES 5-9) |  |  |
| The programmust include the following courses or approved substitutions required by the Fariborz Maseeh Department of Mathematics and Statistics. |  |  |
| Courses |  |  |
| Mth 211 | Foundations Of Elementary Mathematics I | 4 |
| Mth 212 | Foundations Of Elementary Mathematics II | 4 |
| Mth 213 | Foundations Of Elementary Mathematics III | 4 |
| Mth 491 | Experimental Probability and Statistics for Middle School Teachers | 4 |
| Mth 493 | Geometry for Middle School Teachers | 4 |
| Mth 494 | Arithmetic and Algebraic Structures for Middle School Teachers | 4 |
| Mth 495 | Historical Topics in Mathematics for Middle School Teachers | 4 |
| Mth 496 | Concepts of Calculus for Middle SchoolTeachers | 4 |
| Mth 497 | Mathematics in the Middle SchoolClassroom | 4 |

## Graduate programs

The FariborzMaseeh Department of Mathematics and Statistics offers work leading to the degrees of Master of Arts, Master of Science, the Ph.D. in Mathematical Sciences and the Ph.D. in Mathematics Education as well as the Graduate Certificate for Middle School Mathematics Teachers and the Graduate Certificate in Applied Statistics.

MATHEMATICS M.A./M.S.
The Master of Arts/Master of Science in Mathematics programis designed for the student who wishes to prepare
for community college teaching, employment in government or industry, or further advanced work toward a Ph.D. in mathematics.

## ADMISSION:

## Programprerequisites:

Transcript(s) must show satisfactory completion of at least the following undergraduate courses: Differential Equations, Linear Algebra, Introductory
Analysis/Advanced Calculus, and Abstract Algebra/Group Theory. These are equivalent to the following PSU courses: Mth 256, Mth 261, Mth 311 and Mth 344.

In addition to programprerequisites, applicants mustmeet the university's minimumadmission requirements including English language proficiency.
This programcurrently offers rolling admissions. See instructions on how to
apply:https://www.pdx.edu/math/graduate-applicationinstructions

## DEGREE REQUIREMENTS

Candidates must complete an approved 45-credit program that includes at least 30 credits in mathematics or statistics. Students shall selecteither Option A or Option B.

Option A: The studentmust satisfy the following requirements:

- Complete 30 credits in Mathematics and Statistics which include approved courses distributed as follows: two 6-cred it sequences at the 600 level, 6 additional credits at the 600 -level, and a 3 -credit Mth 501 course on Mathematical Literature and Problems;
- Pass one written Master's examination in either Algebra or Analysis.

Option B: The student must satisfy the following requirements:

- Complete 30 credits in Mathematics and Statistics which include approved courses distributed as follows: two 6-credit sequences at the 600 level, 6 additional credits at the 600-level;
- Pass two written Master's examinations, one of which must be in either Algebra or Analysis.

Regardles s of the option, students interested in pursuing the M.A. degree must also show proficiency in a second language.

A student must have a minimum 3.00 GPA on the courses applied to the programof study, as well as a minimum 3.00 GPA in all graduate-level courses taken at PSU. Although grades of $\mathrm{C}+, \mathrm{C}$, and C - are below the graduate standard,
they may be counted as credit toward a master's degree with the specific written approval of the departmentif taken at PSU after the term of formal admission to the graduate program. All courses counting toward the degree must be letter-graded. The pass/no pass option is not allowed.

Students are responsible for knowing University-level graduate policies and procedures for obtaining the degree. These policies and procedures are in the Graduate School section of thePSU Bulletin. Several of the most frequently asked about University-level graduate policies and procedures can also be found on the Graduate School website.

## Approved courses for the degree:

| Mth 511 | Introduction to Real Analysis I | 3 |
| :---: | :---: | :---: |
| Mth 512 | Introduction to Real Analysis II | 3 |
| Mth 513 | Introductionto Real Analysis III | 3 |
| Mth 521 | Theory of Ordinary Differential EquationsI | 3 |
| Mth 522 | Theory of Ordinary Differential Equations II | 3 |
| Mth 523 | Theory of Ordinary Differential Equations III | 3 |
| Mth 524 | Elementary Differential Geometry I | 3 |
| Mth 525 | Elementary Differential Geometry II | 3 |
| Mth 527 | Partial Differential Equations I | 3 |
| Mth 528 | Partial Differential Equations II | 3 |
| Mth 530 | Topics in Mathematical Modeling | 3 |
| Mth 531 | Topics in Geometry I | 3 |
| Mth 532 | Topics in Geometry II | 3 |
| Mth 533 | Topics in Geometry III | 3 |
| Mth 534 | Set Theory and Topology I | 3 |
| Mth 535 | Set Theory and Topology II | 3 |
| Mth 536 | Set Theory and Topology III | 3 |
| Mth 541 | Introductionto Abstract Algebra I | 3 |
| Mth 542 | Introduction to Abstract Algebra II | 3 |
| Mth 543 | Introduction to Abstract Algebra III | 3 |
| Mth 544 | Advanced Linear/Multilinear Algebra I | 3 |
| Mth 545 | Advanced Linear/Multilinear Algebra II | 3 |
| Mth 549 | Topics in Advanced Number Theory | 3 |
| Mth 551 | Numerical Calculus I | 3 |
| Mth 552 | Numerical Calculus II | 3 |
| Mth 553 | Numerical Calculus III | 3 |
| Mth 556 | Topics in Combinatorics | 3 |
| Mth 557 | The Mathematical Theory of Games I | 3 |

Introduction to Real Anasis
Mth 513 Introduction to Real Analysis III 3
Mth 521 Theory of Ordinary Differential Equations I
Mth $522 \quad$ Theory of Ordinary Differential Equations II
$\begin{array}{lll}\text { Mth } 523 & \text { Theory of Ordinary Differential } & 3 \\ \text { Mth 524 } & \text { Equations III } & \\ & \text { Elementary Differential } & 3 \\ \text { Meometry I } 525 & \text { Elementary Differential } & 3\end{array}$
Mth $527 \quad$ Partial Differential Equations I 3
$\begin{array}{lll}\text { Mth 528 } & \text { Partial Differential Equations II } & 3 \\ \text { Mth 530 } & \text { Topics in Mathematical } & 3\end{array}$

Mth 531 Topics in Geometry I 3
Mth 532 Topics in Geometry II 3
Mth 533 Topics in Geometry III 3
Mth $534 \quad$ Set Theory and Topology I 3
Mth $536 \quad$ Set Theory and Topology III 3
Mth 541 Introduction to Abstract Algebra 3

Mth 552 Numerical Calculus II 3
Mth 553 Numerical Calculus III 3
Mth 556 Topics in Combinatorics 3 Games I

Probability Theory I

Mth 558

Mth 561
Mth 562
Mth 564
Mth 565
Mth 570
Mth 571
Mth 572
Mth 577
Mth 578
Mth 611

Mth 612
Mth 613

Mth 614
Mth 615
Mth 616
Mth 617
Mth 618
Mth 619
Mth 621
Mth 622

Mth 623
Mth 624
Mth 625

Mth 626

Mth 634
Mth 635
Mth 636
Mth 637
Mth 638
Mth 639
Mth 641
Mth 642
Mth 643
Mth 651
Mth 652
Mth 653
Mth 661
Mth 662
Mth 663
Mth 667

Algebraic Graph Theory I
Algebraic Graph Theory III 3
Stochastic Processes and
3
The Mathematical Theory of

Modern Algebra I

Advanced Numerical Analysis I
Advanced Numerical Analysis II
Advanced Numerical Analysis III

| Mth 668 | Stochastic Processes and | 3 |
| :---: | :---: | :---: |
|  | Probability Theory II |  |
| Stat 561 | Mathematical Statistics I | 3 |
| Stat 562 | Mathematical Statistics II | 3 |
| Stat 564 | Applied Regression Analysis | 3 |
| Stat 565 | Experimental Design: Theory and Methods I | 3 |
| Stat 566 | Experimental Design:Theory and Methods II | 3 |
| Stat 567 | Applied Probability I | 3 |
| Stat 661 | Advanced Mathematical | 3 |
|  | Statistics I |  |
| Stat 662 | Advanced Mathematical | 3 |
|  | Statistics II |  |
| Stat 663 | Advanced Mathematical | 3 |
|  | Statistics III |  |
| Stat 664 | Theory of Linear Models I | 3 |
| Stat 665 | Theory of LinearModels II | 3 |
| Stat 666 | Theory of Linear Models III | 3 |

Check with the programadviserfor additional courses, including omnibus-numbered courses, which also may be approved for MA/MS programs. "Approved" means that it is approved toward fulfilling the 30 mathematics/statistics credit hours for the MA/MS in Mathematics program.

| Approved |  |  |
| :---: | :---: | :---: |
| Mth 581 | electives for the degree: <br> Topics in Probability for <br> Mathematics Teachers <br> Topics in Statistics for <br> Mathematics Teachers | $2-32$ |
| Mth 583 | Topics in Geometry for <br> Mathematics Teachers <br> Topics in Algebrafor | $2-3$ |
| Mth 584 | Mathematics Teachers | $2-3$ |
| Mth 585 | Topics in Analysis for <br> Mathematics Teachers <br> Topics in The History of | $2-3$ |
| Mth 587 | Mathematics <br> Topics in Discrete Mathematics <br> for Mathematics Teachers | $2-3$ |
| Mth 588 | Topics in Computing for | $2-3$ |
|  | Mathematics Teachers | $1-3$ |

"Approved as elective" means that it is approved inside the 45 total credit hours but not inside the 30 mathematics/statistics credit hours. Check with the programadvis er for additional approved electives.

## M A/MS EXAM INATIONS

Depending on the option chosen, students must pass oneor two Master's exams.

Option A:Student must pass one written examination in either Algebra or Analysis.

Option B: Student must pass two written examinations, one
of which must be in either Algebraor Analysis. Other subject areas include: Geometry, Mathematical Statistics, Numerical Methods, Ordinary Differential Equations, Partial Differential Equations and Set Theory/Topology.

Exams are offered twice a year, during the week prior to the start of fall term and during the first week of spring term. Students may take a given area examination at most two times. Students must be registered for and complete at least one graduatecredit during the term(s) in which they take an exam. For complete details see the full MS Exam Policy (https://www.pdx.edu/math/ms-exam-policy).

## MTH 501 M ATHEM ATICAL LITERATURE AND PROBLEMS

In this 3-credit course, a student works under the supervision of a faculty member in an area of mathematics in which the student has acquired the background needed to read current mathematical literature, prepare a res earch paper, and present this research in a colloquium. Requirements for the course are contained in the Guidelines and Deadlines for Literature and Problems Seminar which is also available in the department office. Please note that you must be registered for at least one graduate credit during the termin which you plan to presentyour 501 research.

## PLANNING AN MA/MSIN M ATHEMATICS DEGREE PROGRAM

The department offers courses in pure and applied mathematics and in statistics. Students may choose an emphas is in one or more of these areas. The Course Projection Guide (CPG: https ://app.banner.pdx.edu/cpg/) lists the projected future 600-levelcourseofferings. These projections enable students to plan programs that include any necessary 500 -level prerequisites. Students also need to plan programs that will prepare themto pass one MA/MS examination or two MA/MS examinations depending on the degree option. New students are urged to meet with the MA/MS adviser regarding degree requirements and forhelp with programplanning.

## STATISTICS M.S.

The Master of Science in Statistics programis designed for students who wish to pursue careers as practicing statisticians in industry, government, or academia. It is also designed to prepare students for community college teaching orentry into a Ph.D. in Statistics degree program. The degree is also valuable for people working in other fields who need mastery of a broad range of statistical methods.

## ADM ISSION

## Programprerequisites

Transcript(s) must show successful completion of at least the following undergraduate courses: Advanced Statistical Methods, Introductory Analysis/Advanced Calculus, Linear Algebra, and Differential Equations. These courses are equivalent toPSU's Stat 452 or higher, Mth 311, Mth 261, and Mth 256.
In addition to programprerequisites, applicants must meet the university's minimumadmission requirements including English language proficiency.

This programadmits once per year for fall term only. See instructions on how to apply:
https://www.pdx.edu/math/graduate-applicationinstructions.

## DEGREE REQUIREMENTS

Candidates must complete an approved 45-credit program, which includes at least 30 core credits in courses with the Stat prefix. In addition, students must satisfy Other Requirements (see below).
A student must have a minimum 3.00 GPA on the courses applied to the programof study, as well as a minimum 3.00 GPA in all graduate-level courses taken at PSU. Although grades of $\mathrm{C}+\mathrm{C}$, and C - are below the graduate standard, they may be counted as credit toward a master's degree with the specific written approval of the department if taken at PSU after the term of formal admission to the graduate program.
Students are responsible for knowing University-level graduate policies and procedures for obtaining the degree. These policies and procedures are in the Graduate School section of thePSU Bulletin. Several of the most frequently asked about University-level graduate policies and procedures can also be found on the Graduate School website.

## CORE REQUIREMENTS (30 CREDITS)

The 30 core credits must include courses distributed as follows:
Two 9-credit sequences:

| Stat 561 | Mathematical Statistics I | 3 |
| :--- | :--- | :--- |
| Stat 562 | Mathematical Statistics II | 3 |
| Stat 563 | Mathematical Statistics III | 3 |
| Stat 564 | And | Applied Regression Analysis |
| Stat 565 | Experimental Design:Theory <br> and Methods I | 3 |
| Stat 566 | Experimental Design:Theory <br> and Methods II | 3 |


| One 9-credit sequence chosen from |  |  |
| :---: | :---: | :---: |
| Stat 661 | Advanced Mathematical | 3 |
|  | Statistics I |  |
| Stat 662 | Advanced Mathematical | 3 |
|  | Statistics II |  |
| Stat 663 | Advanced Mathematical | 3 |
|  | Statistics III |  |
|  | or |  |
| Stat 664 | Theory of LinearModels I | 3 |
| Stat 665 | Theory of Linear Models II | 3 |
| Stat 666 | Theory of Linear Models III | 3 |
|  | or |  |
| Mth 667 | Stochastic Processes and | 3 |
|  | Probability Theory I |  |
| Mth 668 | Stochastic Processes and | 3 |
|  | Probability Theory II |  |
| Mth 669 | Stochastic Processes and | 3 |
|  | Probability Theory III |  |
|  | or |  |
| Stat 671 | StatisticalLearning I | 3 |
| Stat 672 | StatisticalLearning II | 3 |
| Stat 673 | StatisticalLearning III | 3 |
| Topics in Statistical Consulting (3 credits) |  |  |
| Stat 570 | StatisticalConsulting | 1-3 |
| ELECTIVES (15 CREDITS) |  |  |
| A total of 15 elective credit hours must be completed. The following list of courses is pre-approved forelectivecredit |  |  |
|  |  |  |
| Stat 501 | StatisticalLiterature and | 3 |
|  | Problems |  |
| Stat 571 | Applied Multivariate Statistical | 3 |
|  | Analysis |  |
| Stat 572 | Bayesian Statistics | 3 |
| Stat 573 | Computer Intensive Methods in | 3 |
|  | Statistics |  |
| Stat 576 | Sampling Theory and Methods | 3 |
| Stat 577 | Categorical Data Analysis | 4 |
| Stat 578 | Survival Analysis | 3 |
| Stat 580 | Nonparametric Methods | 3 |
| Stat 661 | Advanced Mathematical | 3 |
|  | Statistics I |  |
| Stat 662 | Advanced Mathematical | 3 |
|  | Statistics II |  |
| Stat 663 | Advanced Mathematical | 3 |
|  | Statistics III |  |
| Stat 664 | Theory of LinearModels I | 3 |
| Stat 665 | Theory of Linear Models II | 3 |
| Stat 666 | Theory of Linear Models III | 3 |
| Stat 567 | Applied Probability I | 3 |
| Stat 568 | Applied Probability II | 3 |
| Mth 667 | Stochastic Processes and | 3 |
|  | Probability Theory I |  |


| Mth 668 | Stochastic Processes and <br> Probability Theory II | 3 |
| :--- | :--- | :--- |
| Mth 669 | Stochastic Processes and | 3 |
|  | Probability Theory III |  |
| Stat 671 | StatisticalLearning I | 3 |
| Stat 672 | Statistical Learning II | 3 |
| Stat 673 | Statistical Learning III | 3 |
| CS 545 | Machine Learning | 3 |
| Ec 572 | Time Series Analy sis and | 4 |
| USP 655 | Forecasts |  |
|  | Advanced Data Analy sis: | 3 |
|  | Structural Equation Modeling |  |

Otherstatistically oriented courses outside the Department and other mathematics courses may be substituted, but must be approved as electives by thestatistics graduate programadviser. "Approved as elective" means that it is approved inside the 15 elective credit hours but not inside the 30 statistical credit hour core requirements. A course or sequence cannot be counted both within the 30-hour core and as an elective course or sequence.

## OTHER REQUIREMENTS

The student mustsatisfy one of the following options:
Option A: Pass both Master's examinations.
Option B: Pass the Mathematical Statistics examand successfully complete Stat 501.
Option C: Pass the Applied Statistics examand successfully complete Stat 501.

## MS EXAMINATIONS

There are two examinations:
(i) The Mathematical Statistics Exam which covers Stat 561, Stat 562 and Stat 563
(ii) The Applied Statistics Exam which includes the core topics covered in Stat 564, Stat 565, and Stat 566.

Examinations are offered twice a year, the week prior to the start of fall term and during the first week of spring term. Students may take any examination at most two times. Students must be registered for and complete at least one graduatecredit during the term(s) in which they take an exam. For complete details see the full MS Exam Policy (https://www.pdx.edu/math/ms -exam-policy).

## Grading Policy for the MS Exam in Applied Statistics

The Applied Statistics Exam is comprised of two components:

1. Applied regression analysis
2. Design of experiments and ANOVA

Both components consist of a written exam portion and a separate, in-laboratory, statistical computing applications portion. The Applied Statistics Exam may be repeated once; that is, a maximum of two tries is permitted.

A Pass (P) orFail (F) is given on each component.

- Two P's equal a PASS on the exam.
- One P equals a CONDITIONALPASS on the exam. The Examination Committee will inform the student of the requirements for removal of the Conditional.
- Two F's equal a FAIL on the exam. In this case the entire exam must be retaken.


## STAT 501 STATISTICAL LITERATURE AND PROBLEMS

In this course, a student works under the supervision of a faculty member in an area of probability and statistics in which the student has acquired the background needed to read current probability and statistical literature, prepare a research paper, and present this research in a colloquium. Requirements for the course are contained in the handout: Guidelines and Deadlines for Stat 501 StatisticalLiterature and Problems.

## PLANNING AN MS DEGREE PROGRAM

The Course Projection Guide (CPG) lists the projected future 600-level course offerings. These projections enable students to plan programs that include any necessary 500level prerequisites. Students als o need to plan a program that will prepare themto pass the two MS examinations. Students entering the program with core courses Stat 561, Stat 562, Stat 563 and Stat 564, Stat 565, Stat 566 successfully completed and considering future pursuit of the $\mathrm{Ph} . \mathrm{D}$. are encouraged to take Mth 511, Mth 512 and in addition to the required 600 level sequence, at least one additional sequence fromamong Stat 661, Stat 662, Stat 663, Stat 664, Stat 665, Stat 666, and Mth 667, Mth 668, Mth 669. All students are urged to meet with the graduate programadviser regarding degree requirements and for help with programplanning.

## MATHEMATICS FOR TEACHERS M.S.

The M.S. in Mathematics for Teachers (MS-MTCH) is designed for individuals interested in strengthening their understanding of mathematics to enrich theteaching of mathematics. The programprepares teachers in subjects such as geometry, algebra, analysis/calculus, his tory of mathematics, probability, statistics, discrete mathematics, and use of technology in the classroom. The programis intended for individuals with a mathematics degree or a strong background in mathematics.

The M.S. in Mathematics for Teachers programoffers advanced training and s pecialized courses for secondary school teachers of mathematics. The MS-MTCH does not lead to a teaching license. If you are interested in teaching secondary mathematics, please contact the School of Education, GTEP program.

## ADM ISSION

## Programprerequisites:

Transcript(s) must show s atisfactory completion of at least the following undergraduate courses: Linear Algebra, Introductory Analysis/Advanced Calculus, College Geometry, and Abstract Algebra/Group Theory. These courses are equivalent to PSU's Mth 261, Mth 311, Mth 338, and Mth 344. Undergraduate courses in introductory statistics and dis crete mathematics are recommended.

In addition to programprerequisites, applicants must meet the university's minimumadmission requirements including English language proficiency.
This programcurrently offers rolling admis sions. See instructions on how to apply:
https://www.pdx.edu/math/graduate-applicationinstructions

## DEGREE REQUIREMENTS:

An MS-MTCH candidate must complete an approved programof 45 graduate credits which includes a mathematics curriculumproject.
A student must have a minimum 3.00 GPA on the courses applied to the programof study, as well as a minimum 3.00 GPA in all graduate-level courses taken at PSU. Although grades of $\mathrm{C}+, \mathrm{C}$, and C - are below the graduate standard, they may be counted as credit toward a master's degree with the specific written approval of the department if taken at PSU after the term of formal admission to the graduate program. For the MS-MTCH program, all courses must be graded A-F. The pass/no pass grading option is not allowed.

Students are responsible for knowing University-level graduate policies and procedures for obtaining the degree. These policies and procedures are in the Graduate Studies section of the PSU Bulletin. Several of the most frequently asked about University-level graduate policies and procedures can also be found on the Graduate School website.

## Required coursework

Probability/Statistics ( 6 credits)

| Mth 581 | Topics in Probability for <br> Mathematics Teachers | $2-3$ |
| :--- | :--- | :--- |
| Mth 582 | Topics in Statistics for <br> Mathematics Teachers | $2-3$ |
|  | Ma |  |

Geometry ( $\mathbf{3}$ credits)
Mth 583 Topics in Geometry for Mathematics Teachers
Algebra (3 credits)
Mth 584 Topics in Algebrafor Mathematics Teachers

| Analysis (3 credits) |  |  |
| :---: | :---: | :---: |
| Mth 585 | Topics in Analysis for | 2-3 |
| Mathematics Teachers |  |  |
| History/Foundations of Math (3 credits) |  |  |
| Mth 586 | Topics in The History of | 2-3 |
| Mathematics |  |  |
| Discrete Math (3 credits) |  |  |
| Mth 587 | Topics in Discrete Mathematics for Mathematics Teachers | 2-3 |
| Computing ( 3 credits) |  |  |
| Mth 588 | Topics in Computing for | 1-3 |
| Mathematics Teachers |  |  |
| Math Education (3 credits) |  |  |
| Mth 589 | Exposition and Curriculum |  |
|  |  |  |
|  | Development |  |
|  | or |  |
|  | Approved graduate mathematics | 3 |
|  |  |  |
| Mth 501 | Curriculum Research, | 3 |
| Mathematics |  |  |
| Mathematics Electives (9 credits) |  |  |
| Approved graduate-level mathematics courses or statistics courses. |  |  |
| University Electives (6 credits) |  |  |
| Graduate-level courses (Mathematics, Education, or other) approved by the MS-MTCH programadviser. |  |  |
| Alternative math/stat courses may be substituted with approval fromthe MS-MTCH programadviser. Note also that many of these courses are "Topics" courses, and with MS-MTCH adviser approval may be repeated for credit. |  |  |
| For those in MEd/GTEP program, consult with the MSMTCH programadviser for Dual-Degree option. |  |  |
| Courses at the 700 and 800 level are not acceptable in this degree program. |  |  |
| MTH 501 M ATHEM ATICS CURRICULUM PROJECT |  |  |
| As part of the degree requirements, the student will complete a mathematics curriculumproject. In this independentresearch project, the student will explore a mathematical topic and will develop and classroom-test curriculummaterials related to that topic. Under the guidance of a faculty member, the student will prepare a research paper and present this research in a colloquium. Requirements for the course are contained in the handout: M.S. in Mathematics forTeachers' CurriculumProjects. |  |  |
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| Planning a MS-MTCH Degree Program: |  |  |

Many of the courses are offered on a three-year cycle. Refer to the Course Projection Guide (CPG, https://app.banner.pdx.edu/cpg/). It is important to take as many of the required courses as you can prior to choosing elective courses. Also, start thinking about the 501 Mathematics CurriculumProject early in your program. It generally takes at least three terms to narrow in on a topic, choose a 501 adviser, put a project committee together, do the background research, develop the materials and test themwith students, evaluate the results, finish the entire paper, and make a public presentation of your work. Meeting with the MS-MTCH programadviser to plan your degree will make the process much smoother. Additional degree planning tips can be found on the Crucial Is sues in Your MS in Mathematics for Teachers Program.

## MATHEMATICAL SCIENCES PH.D.

The Ph.D in Mathematical Sciences at Portland State University is a research degree. It aims to develop student's ability to conduct and share original research. The program is flexible, learner driven, and provides participants with a structured environment, professional guidance, and advising support. Mathematical Sciences at PSU encompass a wide range of specialties as can be seen from our faculty profiles webpage. Traditionally at PSU, students often engage in multidis ciplinary research work and take graduate courses in other departments. The programprepares for academic professions as well as a broad range of non academic professions. Indeed, Mathematical Sciences forman integral part of emerging fields such as computational medicine/biology, artificial intelligence, information security, and e-sciences. In today's data-intensive world, MathematicalSciences allow to ans wer questions and solve problems in areas as diverse as economics and finance, government and law, the arts and music, medicine, weather and air quality forecasting, climate modeling, and national defense in addition to its traditional application in the physical sciences. The programis flexible, learner driven, and provides participants with a structured environment, professional guidance, and advising support.
The programaccommodates a broad range of interdis ciplinary partners. Students choose a main concentration within the Mathematical Sciences as well as a secondary concentration. This secondary concentration can be chosen within the Mathematical Sciences or alternatively, within the natural sciences, social sciences, or engineering. Typical examples of secondary concentrations outside of Mathematical Sciences include Computerscience, Engineering, Physics, Biology, Economics, Systems Science, Finance, Urban Studies and Planning, Public Health and Medicine.

## ADMISSION

## Programprerequisites:

Applicants for admis sion to the Mathematical Sciences Ph.D. programwill be expected to have completed an undergraduate degree with the equivalent of a bachelor's degree in Mathematics or Statistics containing an adequate background in Computer Science. Applicants with degrees in related disciplines will be considered provided the applicant demonstrates a strong mathematical proficiency. Admission to the programrequires that the department find the applicant prepared to undertake study leading to the doctoral degree in mathematics.
In addition to programprerequisites, applicants mustmeet the university's minimumadmission requirements including English language proficiency.

This programadmits once per year for fall term only. See instructions on how to apply:https://www.pdx.edu/math/graduate-applicationinstructions

## DEGREE REQUIREMENTS

Below is an overview of the program. For additional details please read the general rules in the Graduate School section of the PSU Bulletin.

## I. Planning a Ph.D. in Mathematical Science Program:

Upon admis sion to the programthe student will be assigned an academic adviser providing support for the student's exam schedule and programof courses. After satisfactory completion of the qualifying and comprehensive examinations, a dis sertation committee headed by a thesis adviser will be appointed to supervise the remainder of the student's program. The Graduate School has a summary of the procedures for doctoral degrees on their
website:https://www.pdx.edu/gradschool/summary -of-procedures-doctoral-degrees

## II. Course requirements:

A minimum of 81 credit hours distributed as follows:
Approved graduate level courses - 42 credits
a) Primary concentration: Mathematics and Statistics courses at the 600 level -18 credit minimum.
b) Secondary concentration: courses at the 600 level in Mathematics and Statistics or courses at the 500 and 600 level offered in another discipline -9 credit minimum.
c) Other courses in Mathematics and Statistics at the 500 and 600 level, including Mth/Stat 601 (non-dissertation research) - 15 credits. For students entering the program with a Master's degree, up to 9 credits can be transferred from graduate Mathematics or Statistics courses offered in other universities.

Mathematical/StatisticalLiterature and Problems course (Mth/Stat 501)- 3 credits. This requirementcan be waived in full or partially in case of a Master's thesis or a similar exercise performed in another university. When a partial waiver is provided, the candidate is asked to performan oral presentation of his Master's thesis or similar exercise under the rules of the Mth/Stat 501 course.

Doctoral seminar (Mth 607) or Internship (Mth 604) - 9 credits.

Dis sertation (Mth 603) - 27 credits .
Moreover, the candidate will be expected to participate in colloquia and research seminars presented in the department.

## III. Examinations:

Qualifying examinations: These exams are intended to verify that the student has the prerequisites for high-level mathematical courses and also to verify that the student has the bas ic capabilities and interest in mathematical research. This examination consists of two Master's level written examinations offered in the Fariborz Maseeh Department of Mathematics and Statistics ("the department"), as well as defending a Mth 501/Stat 501 Mathematical/Statistical Literature and Problems course. In both cases, this course consists of reading critically a research article and presenting it in writing as well as orally in front of a mathematically literate audience. The qualifying examinations are to be completed before the end of the second year after enrollment in the program, so that the student may engageearly-on in the study of higher level mathematics and in research.

Comprehensive examinations: This is an oralexam conducted by an examining committee composed of three or more PSU faculty members, a majority of which hold a primary appointment in the department. The scope of the exam is determined by a syllabus prepared by the candidate's examining committee. The syllabus reflects the primary as well as the secondary concentration of the candidate. A student may receive fromthe examining committee a grade of unconditional pass, conditional pass (with conditions specified by the examining committee), or fail. A (strict) majority of votes in favor of either pass or conditional pass is needed for the student not to fail the exam. The candidate is allowed to stand for this examat most twice, and must pass this exam within five years after entering the programto continue.

## IV. Dissertation:

Upon the successful completion of the course and examination requirements, the student proposes for approval by the Mathematical Sciences Ph.D. committee and subsequently by the Graduate School, a dissertation committee. This committee comprises a research adviser who is a faculty member in the department and at least three other faculty members. Additional faculty members
may also serve on the dis sertation committees. Overall, at least half of the members of the dissertation committee must be members of the department. The dis sertation committee must also satisfy the rules dictated by the Graduate School.

## V. Advancement to Candidacy:

With guidance from the dis sertation committee, the student will prepare a thesis proposal and presentation. The goalof this presentation is to inform the committee of the intent of the dis sertation and receive their critical comments. Upon subsequent recommendation of the dissertation committee, the student is recommended for advancement to candidacy for the degree of Doctor of Philosophy.

## VI. Thesis Defense:

After preparation of the written dissertation, and with the approval of the dis sertation committee, the Ph.D. degree candidate will present their work in a dissertation defense culminating in their research activities.

## VII. Residency:

A minimum of three consecutive terms in this program must be spent in full-time residence at Portland State University.

## MATHEMATICS EDUCATION PH.D.

The Fariborz Maseeh Department of Mathematics and Statistics offers a Ph.D. in Mathematics Education. The main objective of this programis to developeducators with an understanding of mathematics and its teaching and learning, and with the capabilities for research and professional practice in the field. This programprovides a balance between mathematics and mathematics education in order to develop mathematics educators who can become:(i) Faculty members in mathematics departments or schools of education in universities, four year colleges, or community colleges; (ii) Curriculums pecialists in mathematics, supervisors of mathematics at the middle school levelor secondary school level, or mathematics specialists in state or local departments of education; (iii) Private sector s pecialists in mathematics education.

## ADMISSION:

## Programprerequisites:

Candidates in this programmust currently have (or complete during their program) a master's degree in mathematics equivalent to the MA/MS in Mathematics degree or the MS-MTCH degree at Portland State University.
In addition to programprerequisites, applicants mustmeet the university's minimumadmission requirements including English language proficiency.

This programadmits once per year for fall term only. See instructions on how to apply:
https://www.pdx.edu/math/graduate-applicationinstructions

## DEGREE REQUIREMENTS

Students are responsible for knowing University-level graduate policies and procedures for obtaining the degree. These policies and procedures are in the Graduate School section of thePSU Bulletin. Several of the most frequently asked questions about University-level graduate policies and procedures can also be found on the Graduate School website.
Candidates must complete an approved programof 84 credit hours consisting of three major components: cours ework, a research practicumexperience, and dis sertation research.

## Coursework mustinclude a minimum of:

- 18 credit hours in Mathematics Education Research Courses (Mth 690-695);
- 18 credit hours of other 500-600 level mathematics courses; and
- 18 hours of graduate coursework in supporting areas outside of mathematics (such as curriculumand instruction, psychology, educational policy, science, computer science, philosophy, sociology, anthropology, etc.)


## Research PracticumMth 601 (3 credits)

The purpose of the research experience will be to provide candidates with an opportunity to use methodological techniques in mathematics educationearly on in their course of study. Prior to the dissertation, candidates will be expected to gain experience with the qualitative and quantitative approaches that are now used by many researchers and curriculumdevelopers in mathematics education. Some examples of possible research practicum experiences are: case studies of students' learning documented over time, studies of teachers' practice in the mathematics clas sroom, documentation of teachers' beliefs about mathematics as they implement new curricula.

## Diss ertation Research Mth 603 ( 27 credits)

The Ph .D. dis sertation research will ordinarily be conducted under the guidance of a mathematics educator in the FariborzMaseeh Department of Mathematics and Statistics. The dissertation is the most important part of a candidate's program, and involves identifying and researching a significant problemwhich builds upon previous research, and which will make an original contribution to an area of research in mathematics education. Dis sertation committees consisting of a mix of faculty with expertise in mathematics education, mathematics, curriculumand instruction, and other areas outside of mathematics education will be encouraged. After completing the comprehensive examinations, the chairpers on and dissertation committee will be appointed.

The student will develop a dissertation proposal which will be defended in an oral presentation to the committee. When the proposal has been approved by the committee, and if neces sary by the University Human Subjects Research Review committee, the student will be considered a candidate for the Ph.D. in mathematics education. The dissertation must be completed according to the outlines of the proposal approved by the candidate's committee. Students must register for dis sertation credit during each term they are engaged in dissertation research. Upon completion of doctoral thesis work, the candidate will defend the dissertation before the committee in an oral presentation that is open to other interested faculty and students. The student is expected to demonstrate knowledge of the research literature in mathematics education that relates to the particular problemchosen for research, and to show how the dissertation contributes to work in this area.

## Demonstrated competency areas:

Prior to completing their program, candidates in the Mathematics Education Ph.D. program will be expected to demonstratecompetency in the following 7 areas:

1. mathematics education
2. mathematics
3. supporting content areas
4. teaching
5. the use of technology in teaching mathematics
6. the application of mathematics education in an urban setting
7. research in mathematics education

## 1. Mathematics Education:

The competency in mathematics education can be met by successfully completing graduate coursework in mathematics education and the psychology of learning and by pas sing a written, comprehensive exam.
Coursework: Candidates must successfully complete the 6 graduate seminars in Mathematics Education (Mth690, Mth 691, Mth 692, Mth 693, Mth 694, and Mth 695) and at least one course in the psychology of learning. Course titles and descriptions are listed below.

Comprehensive Exam in Mathematics Education: Prior to being advanced to candidacy, students must pass and orally defend a written, comprehensiveexam that covers the key developments and theoretical perspectives on the history of mathematics education, the teaching and learning of mathematics, and the development of curriculumin mathematics. The implications of this information for urban populations and settings will also be included. Students will have two weeks to compose their responses, which they will defend orally before an examination committee.

## 2. Mathematics:

Applicants to the Ph.D. in Mathematics Education are expected to have at leasta master's degree in mathematics or a degree equivalent to the MS-MTCH (p. 303) degree at Portland State University. The competency in mathematics can be met by successfully completing additional graduatelevel coursework in mathematics beyond the masters and by passing a written comprehensiveexam.

Coursework: Candidates must complete an additional 18 graduate-level credits in mathematics beyond the masters (or the equivalent of the MS-MTCH degree at PSU) that together with their master's programreflects a sufficient breadth and depth of the topics in elementary calculus and analysis, linear and abstract algebra, geometry and topology, probability and statistics, and other applications

Comprehensive Exams in Mathematics: Prior to being advanced to candidacy, students must pass and orally defend a written comprehensive examin mathematics that covers the big ideas of analy sis, linear and abstract algebra, plus one of the following areas: probability, statistics, topology, geometry, or applied mathematics. Students will sit for the exam but will have the opportunity to defend their responses orally before an examination committee.

## 3 Supporting Content Areas:

The competency in supporting contentarea(s) can be met by successfully completing 18 graduate credit hours in areas outside of mathematics such as, curriculumand instruction, psychology, educational policy, science, computer science, philosophy, sociology, anthropology, etc. Candidates will be expected to plan this portion of their programin consultation with their adviser so that the 18 credits forms a coherent supporting focus and includes at least one course in the psychology of learning.

## 4. Teaching:

It is recommended that candidates in the Ph.D. program acquire mathematics teaching experience at both the K-12 and the college level. At a minimum, candidates must demons trate competency in teaching mathematics for at least one of these two levels.

## 5. The Use of Technologies in Teaching Mathematics:

Students will be expected to acquire background and experiences in how students best learn mathematics within technologically enhanced learning environments either by working with students in K-12 clas srooms or by teaching courses in the department that utilize technology (e.g., precalculus, calculus, linear algebra, or differentialequations). The role of technology in mathematics education will be addressed throughout the doctoral program. In the seminar courses on teaching and learning (Mth 693 and Mth 694) and in the topics courses (Mth 695) students will become
versed in the research literature on technology in mathematics education.

The Fariborz Maseeh Department of Mathematics and Statistics also offers Mth 588 'Technology for Teachers" which provides exposure to a variety of technologies including symbolic algebra manipulators (i.e., Maple, Mathematica, and Derive), graphing packages (Derive, various graphing calculators), and geometrical tools (Cabri geometry, Geometer's Sketchpad). In addition students are introduced to the various mathematics resources and information available on the W orld Wide Web. This course, or its equivalent, will be required of all participants in the program.

## 6. Applications of Mathematics Education in an Urban Setting:

Portland State University and the Portland Metro area provide a "natural laboratory" for conducting research on the teaching and learning of mathematics within an urban setting. Moreover, integral to the mis sion of Portland State University is a commitment to work with community partners in the promotion of educational reformK-16. Candidates in the Ph.D. program will be expected to demonstratecompetency in working with urban populations and settings either by providing service or conducting research with community partners.

## 7. Research in Mathematics Education:

The competency in research in mathematics education can be met by successfully completing coursework in research in mathematics education, a research practicumproject, and the doctoral dis sertation.

Coursework: Students need to demonstrate experience with both quantitative and qualitative research methods which can be done through coursework and within the research practicum. Students must successfully complete Mth 692, Research Methodology and Research Design in Mathematics Education. Some students may also wish to take some additional coursework in research methodologies fromoutside areas.

## Residency

In a doctoral program, the residency requirement can be satisfied in one of the follow ways:

- Three terms of full-time enrollment (minimum 9 graduate credits applicable to the degree programeach term) during the first two years after admis sion to the program. This may include one or more summer terms.
- Six terms of part-time enrollment (minimum 1 graduate credit applicable to the degree programeach term) during the first two years after admis sion to the program. This may include one or more summer terms.
- A doctoral student who was enrolled in the s ame major at PSU, and whose matriculation to the doctoral
programimmediately follows (within one calendar year) the master's degree program, may fulfill the residency requirement during the period in which the studentwas enrolled in the master's program


## MATHEMATICS FOR MIDDLE SCHOOL MATHEMATICS TEACHERS GRADUATE CERTIFICATE

The Graduate Certificate in Mathematics for Middle School Mathematics Teachers (GCMS) cons ists of six graduate mathematics courses specifically designed for teachers who desire to teach middle school mathematics. The programprovides a broad mathematics background appropriate for middle school teachers, a familiarity with the current middle school curriculum ideas, and a sensitivity to the special characteristics and needs of early adolescents.

The Graduate Certificate programby itself does not lead to a teaching license. If you are interested in information on how to obtain teacher licensure, please contact the School of Education, GTEP program.

## ADMISSION

## Programprerequisites

1. Completed B.A. or B.S. degree.
2. GPA: 3.0 cumulative undergraduate, or 3.0 for upper divis ion courses, or 3.0 in all graduate credit courses (a minimum of 12 credits).

## 3. Completion of Mth 111 and Mth 112 (College

 Algebra/Trigonometry) and Mth 211, Mth 212, Mth 213 (Foundations of Elementary Mathematics) or the equivalent.The admiss ion requirements are consistent with admis sion to graduate study in the Department of Curriculumand Instruction in the College of Education. If admitted to graduate study in the Department of Curriculumand Instruction, the graduate credits of the GCMS may be applied toward an M.A. or M.S. in that department (please see an adviser in the College of Education for this option).

In addition to programprerequisites, applicants must meet the university's minimumadmis sion requirements including English language proficiency.
This programcurrently offers rolling admis sions.
Instructions on how to apply: if you are not already enrolled in a graduate degree programat Portland State University then see this page for admis sion instructions:https://www.pdx.edu/math/graduate-application-instructions

If you are currently a graduate student and wish to add the certificate to your program, please submit a GO-19 Request for Changeof Major form. The form must be signed by your current department's Chair before submitting it to the Mathematics and Statistics department.

## PROGRAM GOALS, OBJECTIVES:

The goals of the middle school mathematics certificate programare to offer a comprehensive mathematics program that:

- Directly relates the content of mathematics courses for pre- and in-service teachers to the mathematical content appropriate for middle schools tudents.
- Is geared to the special characteristics of the student population of an urban university, and takes advantage of the varied resources found in an urban setting.
- Models a philosophy of teaching and learning mathematics that is consistent with current recommendations for effective instruction in middle school clas srooms.

The coursecontent and instructional practices of this graduate certificate programare consistent with the mathematical reform recommendations of the National Council of Teachers of Mathematics and the Mathematical Association of America.

The GCMS gives teachers an opportunity to enrich and broaden their mathematics background and to experience an environment that models the way we believe middle school mathematics should betaught. That is, teaching prospective middle school teachers in the manner that we would expect themto teach mathematics in middle school clas srooms. In our courses we try to practice the following:

- Problem solving activities that promote exploration and experimentation and which allow students to construct (and reconstruct) mathematical understanding and knowledge.
- Use of models, concrete materials, diagrams, and sketches that promote visual reasoning as well as symbolic deductive modes of thought.
- Development of multiple strategies or approaches to problems - discussing and listening to how others think about a concept, problem, or idea.
- Small group work and cooperative learning.
- Extensive use of writing on mathematical investigations and problemsummaries.
- Written communication between instructors and individualstudents.
- Multiple methods of assessment.
- Developing an awareness of one's own mathematical thought processes (and feelings about mathematics) and those of others.
- Supportive and cooperative class environment.


## CORE REQUIREM ENTS

The certificate programconsists of the following six (6) mathematics courses totaling 24 credits.

## Courses

Mth 591
Experimental Probability and
Statistics for Middle School Teachers
Mth 593 Geometry for Middle School
Teachers
Mth 594
Arithmetic and Algebraic Structures for Middle School Teachers
Mth 595 Historical Topics in Mathematics
for Middle School Teachers
Mth 596 Concepts of Calculus for Middle
Mth 597 Mathematics in the Middle
SchoolClassroom

Succes sful completion of the certificate requires students to have a cumulative PSU graduate GPA of 3.0 orhigher (computed on all graduate credits taken at PSU) and a cumulative programGPA of 3.0 or higher (computed on all courses used for the graduate certificate). Please contact the programadviser during the termprior to the termof anticipated graduation to confirm that all program requirements have been completed. Instructions for applying to graduate as well as application deadlines can be found on the Graduate School's website.

Students are responsible for knowing University-level graduate policies and procedures for obtaining the degree. These policies and procedures are in the Graduate School's section of the PSU Bulletin. Several of the most frequently asked about University-level graduate policies and procedures can also be found on the Graduate School's website.

## APPLIED STATISTICS GRADUATE CERTIFICATE

The Graduate Certificate Programin Applied Statistics (GCAS) is primarily des igned to provide a companion credentialfor students in other graduate programs (including Mathematics) who have demonstrated expertise in methods and techniques for the quantitative analysis and modeling of data. Graduate programs that share a common interest in the application of statistical methods to the analys is of data and the solutions of problems include: Psychology, Civil and EnvironmentalEngineering, Economics, Electrical and Computer Engineering,

Computer Science, Engineering and Technology Management, Environmental Sciences and Resources, Mechanical Engineering, PoliticalSciences, Sociology, Urban Studies, Systems Science. However, the GCAS programequally serves those who want to pursue just the graduate certificate.

## ADMISSION:

## Programprerequisites:

Prospective students must have a basic preparation in mathematics and statistics and in a particular dis ciplinary field that would allow for advanced work in statistical methods as well as applications in one or more content areas. This preparation must be demonstrated by the completion of calculus-based courses in probability and distribution theory. A background in basic statistical methodology is as sumed. Prerequisites for the GCAS are: 3 terms of Calculus (Mth 251-253), Linear Algebra (Mth 261), and a statistical methods course (Stat $452 / 552$ or Stat 244). As the sequence Stat 551 , Stat 552 is a prerequisite, it is not applicable toward programrequirements.
In addition to the programprerequisites, applicants must meet the university's minimum admission requirements including English language proficiency.

This programcurrently offers rolling admissions.
Instructions on how to apply: if you are not already enrolled in a graduate degree programat Portland State University, see this page for admission instructions: https://www.pdx.edu/math/graduate-applicationinstructions. If you are currently a graduate student and wish to add the certificate to your program, please submit a GO-19 Request for Change of Major form. The form must be signed by your current department's Chair before submitting it to the Mathematics and Statistics department.

## PROGRAM GOALS, OBJECTIVES:

Many graduate programs include a research methods component that requires the student to acquire some exposure to statisticalmethods as the basis for the design of experiments and analysis of data. The Graduate Certificate in Applied Statistics (GCAS) goes well beyond those requirements -- the student develops both a depth of understanding of methods and a breadth of application across disciplines. It is expected that a student who earns this certificate would be capable of performing sophisticated statistical analysis and modeling for problems within his orher particular discipline. They would also be expected to be able to access and understand consultation with professional statisticians and provide consultation in the application of statistical methods for research purposes and in the solution of practical problems. The goal of the GCAS programis a coordinated plan for which students will be assured of exposure to statistical techniques needed in most applications.

## CORE REQUIREMENTS:

This Graduate Certificate credential may be completed with a minimum of 24 credit hours of statistical graduate coursework with no comprehensive exam, while the MS in Statistics requires more extensive coursework and examinations.

Graduate certificate students must have a minimum 3.00 GPA on all courses applied to the programof study, as well as a minimum 3.00 GPA in all graduate-level courses taken at PSU. Although grades of $\mathrm{C}+, \mathrm{C}$, and C - are below the graduate standard, they may be counted as credit toward a graduate certificate with the specific written approval of the program.
Students are responsible for knowing University-level graduate policies and procedures for obtaining the certificate. These policies and procedures are in the Graduate School section of the PSU Bulletin. Several of the most frequently asked questions about University-level graduate policies and procedures can also be found on the Graduate School website.

## Course of Study

The programof study leading to a GCAS requires the successful completion of a minimum of 24 graduate credit hours of cours ework dis tributed as three components:

1. Applied statistics core sequence: The goal of this sequence is to introduce students to fundamentals of applied statistics. The three-termcore course sequence: Stat 564 Applied Regression Analysis (3 credits) and Stat 565, Stat 566 Experimental Design: Theory and Methods I, II, (3 credits each)
2. Additional applied statistics courses: The objective is developing a breadth of knowledge in the application of statistical methods within the discipline and in related areas. A minimum of 12 additional hours chosen from the list of interdisciplinary courses below. Please note that 510/610 courses and Stat 551, Stat 552 are not acceptable toward the certificate.
3. Statistical consulting: To provide experience in dealing with real statistical problems Stat 570 Statistical Consulting ( 3 credits). Please note that this course is only offered during spring term.

All courses applied to the certificate programmust have a B- orbetter grade. To continue in the program, students are required to maintain regular graduate studentstatus, requiring a cumulative 3.00 GPA for all coursework and a term GPA of at least 2.67.

```
Theory courses
Mth 667 Stochastic Processes and
    Probability Theory I
Mth 668 Stochastic Processes and
    Probability Theory II
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Mth 669
Stat 561
Stat 562
Stat 563
Stat 661
Stat 662
Stat 663

Stat 664
Stat 665
Stat 666
Stat 671
Stat 672
Stat 673

Stochastic Processes and 3
Probability Theory III
Mathematical Statistics I 3
Mathematical Statistics II 3
Mathematical Statistics III 3

Advanced Mathematical 3
Statistics I
Advanced Mathematical 3
Statistics II
Advanced Mathematical 3
Statistics III
Theory of Linear Models I3

Theory of Linear Models II 3
Theory of Linear Models III 3
StatisticalLearning I 3
StatisticalLearning II 3

StatisticalLeaming $I I$
Additional applied statistics interdisciplinary course list:
CE EnvironmentalData Analysis
566/ESM
566
CS 545
Ec 572 Time Series Analysis and 4
Machine Learning 3

Forecasts
Ec 575 Applied AdvancedEconometrics 4
ME 588 Design of Industrial Experiments 4
PA 551 Analytic Methods in Public 3
Administration I
PA 552 Analytic Methods in Public 3
Administration II
Psy 523 Structural Equation Modeling 4
Psy $524 \quad$ Research Design in Applied 4
Psychology
Soc $593 \quad$ Quantitative Methods 4
Soc 597 Applied Survey Research 4
Stat 567 Applied Probability I 3
Stat 568 Applied Probability II 3
Stat 571 Applied MultivariateStatistical 3
Analysis
Stat $572 \quad$ Bayesian Statistics 3
Stat 573 Computer Intensive Methods in 3 Statistics
Stat 576 Sampling Theory and Methods 3
Stat 577 CategoricalData Analysis 4
Stat $578 \quad$ Survival Analysis 3
Stat $580 \quad$ Nonparametric Methods 3
USP 532 Data Collection 4
Please contact the programadvis er during the term prior to the anticipated graduation term to confirmthat all program requirements have been completed. Instructions for graduation application and deadlines can be found on the Graduate School's website.

## Philosophy

1721 SW Broadway, Cramer Hall, Suite 241
503-725-3524
www.pdx.edu/philosophy/

- B.A., B.S.
- Minor
- Minor in Science, Technology, and Society (for the requirements for this interdisciplinary minor, see History (p. 279))


## Undergraduate program

Philosophy is the study of the most fundamental issues concerning reality, knowledge, and value. Its fields include metaphysics (ultimate nature of reality), epis temology (nature of knowledge and reasoning), andethics (principles of moral obligation). Through the study of the Philosophy Department's curriculum, students learn aboutthe historical traditions and contemporary theories in these fields. Philos ophy also examines the basic concepts, principles, and arguments of the major scientific and intellectual disciplines concerned with the study of domains of reality, features and practices of knowledge, and social values and arrangements. These topics are addressed in areas such as philosophy of science, philosophy of mind, philosophy of language, philosophy of law, political philos ophy, and philosophy of religion.
The study of philosophy enriches students' lives as metaphysical, epistemological, and ethical reflection is essential to individual development and cultures across time and place. Moreover, philosophy enhances skills of abstract thinking, clear argumentative writing, careful reading and analysis of texts, and oral argument. Philosophical training is then valuable in almost any area of life and any occupation that requires examination and analys is of problems, criticalevaluation of alternative solutions, and rational advocacy of conclu sions and courses of action. Philosophy is also an excellent undergraduate major for pre-professional students: philosophy majors outscore allother majors on the Graduate Record Exam (GRE's) and receive scores among the highest on the LSAT's, GMAT's, andMCAT's. It is ideal for those who aspire to work in the legal profession and fitting for students planning careers in medicine. And finally, as the quintessential interdisciplinary courseof study, philosophy is a wonderful second-major and compliments the course of study in the physical and social sciences, arts, and humanities.

## DEGREE MAPS AND LEARNING OUTCOMES

To view the degree map and expected learning outcomes for Philosophy's undergraduate degree, go to www.pdx.edu/academic-programs/a-z.

## ADMISSION REQUIREMENTS

Admission to the department is based on general admission to the University. See Admis sions Requirements (p. 8) for more information.

PHILOSOPHY B.A./B.S.

## REQUIREMENTS

In addition to meeting the general University degree requirements, the philosophy major must take a minimum of 56 credits in philos ophy courses. Specific requirements are as follows:

| Courses |  |  |
| :--- | :--- | :--- |
| Phl 201 | Introductionto Philosophy | 4 |
| Phl 301U | Ancient Philosophy | 4 |
| Phl 303U | Early Modern Philosophy | 4 |
| Phl 308U | Elementary Ethics | 4 |
| Phl 324U | Introductionto Formal Logic I | 4 |
| Phl 380 | Philosophical Writing | 4 |

Two courses taken from the following (historical figures): (8 credits)

| Phl 414 | Plato | 4 |
| :--- | :--- | :--- |
| Phl 415 | Aristotle | 4 |
| Phl 416 | The Rationalists: Descartes, | 4 |
|  | Leibniz, Spinoza |  |
| Phl 417 | The Empiricists | 4 |
| Phl 419 | Kant | 4 |
| Phl 420 | Wittgenstein | 4 |
| Phl 451 | ClassicalFigures | 4 |

Four courses taken from the following (thematic
courses): ( 16 credits)

| Phl 423 | Metaphysics | 4 |
| :--- | :--- | :--- |
| Phl 424 | Epistemology | 4 |
| Phl 432 | Philosophy of Mind | 4 |
| Phl 433 | Philosophy of Language | 4 |
| Phl 445 | Advanced Ethics | 4 |
| Phl 446 | Topics in Ethics | 4 |
| Phl 447 | Topics in Social and Political | 4 |
|  | Philosophy |  |
| Phl 448 | Biomedical Ethics | 4 |
| Phl 449 | Philosophy of Sustainability | 4 |
| Phl 460 | Contemporary European | 4 |
| Phl 470 | Philosophy |  |
| Phi 471 | Popics in Philosophy of Science | 4 |
| Phl 474 | Philosophy of Logic | 4 |
|  | Philosophy electives | 4 |

BST 378 and NAS 351 may count towards the 8 credits of Philosophy electives.
Subtotal: 56
A maximum of 8 credits of philosophy taken under the undifferentiated grading option (pass/no pass) are
acceptable toward fulfilling department major requirements.

## PHILOSOPHY HONORS OPTION

The Philos ophy Department's Honors Option is designed to challenge and enrich the educational experience of outstanding philosophy majors and, with a successful completion, recognize and honor their achievements. Application process: students must apply to be admitted. To apply, fill out an application (available at the department office) and submit it together with a DARS report and a writing sample to the honors option coordinator. The requirements to qualify for departmental honors include: at least junior standing; completion of at least 20 credits of Philosophy including at least one 400levelcourse; minimumGPA of 3.50 in Philosophy courses; writing sample. Requirements for receiving departmental honors include: completion of Honors Seminar (Phl 485) and Honors Thesis (Phl403) with receipt of A- or above in both courses; minimum GPA of 3.5 in philosophy courses at graduation; at least 60 credits in Philosophy. For further details on requirements, expectations, and procedures, please contact the department office or honors option coordinator.

## PHILOSOPHY MINOR

## REQUIREMENTS

To earn a minor in philosophy a student mustcomplete 28 credits ( 8 credits of which must be taken in residence at PSU), to include the following:

## Courses

| Phl 201 | Introduction to Philosophy | 4 |
| :--- | :--- | ---: |
| Phl 301U | Ancient Philosophy | 4 |
| Phl 303U | Early Modern Philosophy | 4 |
| Phl 308U | Elementary Ethics | 4 |
|  | Philosophy electives | 12 |

Philosophy electives: to include a minimum of 8 credits in upper-division courses; BST 378 and NAS 351 may count towards the 8 credits.
Subtotal: 28
A maximum of 4 credits of philosophy taken under the undifferentiated grading option (pass/no pass) are acceptable toward fulfilling department minor requirements.

## Physics

134 Science Research and Teaching Center (SRTC) 503-725-3812
www.pdx.edu/physics/

- B.A., B.S.
- Minor
- Secondary Education Program
- M.A.,M.S.
- Ph.D. - Applied Physics


## Undergraduate programs

Physics is the branch of knowledge that attempts to explain all of the phenomena we observe or infer on earth and in the universe. Its study has made possible a modern understanding of the origin of the universe as well as the behavior of biological materials and chemical processes. Scientists trained in this field can engage in such diverse areas as solid state devices, particle physics, energy and the environment, biotechnology, and space travel.
The study of physics does not involve the following of a specific recipe or set of rules; rather it entails developing an attitude or way of looking at phenomena and asking questions. Physicists seek to understand how the physical universe works, no matter what the scale of observationfrom quarks to quasars, from the time it takes the proton to spin, to the age of the cosmos. The answers to these questions are summarized into statements called laws. We live in the age of physical law. Awareness of the beauty, harmony, and interplay of the laws of physics greatly enhances our view and appreciation of our environment.

As an undergraduate, you will take a group of core courses that will give you a general background in the subject. You will study force and motion, heat, optics, electricity, magnetis $m$, atomic and nuclear physics, quantum mechanics, and the physical properties of materials, learning both the theoretical and theexperimental as pects.
Physicists are employed by almost all industries, particularly by the technical industries and by government laboratories. Roughly half of all students with a bachelor's degree in physics go on to graduate work. In addition to a traditional graduate curriculumin physics or astronomy, they can enter programs in optics, applied physics, engineering physics, andeducation. Biophysics, material science, atmospheric physics, environmental science, medical physics, and finance are particularly popular fields now. Environmental programs, electrical engineering, nuclear engineering, and computer science are common graduate school tracks. Medicine and law are also fields that welcome students with physics degrees. Many physicists are entrepreneurs who start their own companies.

## DEGREE MAPS AND LEARNING OUTCOMES

To view the degree maps and expected learning outcomes for Physics' undergraduate degrees, go to www.pdx.edu/academic-programs/a-z.

ADMISSION REQUIREMENTS

Admis sion to the department is based on general admis sion to the University. See Admissions Requirements (p.8) for more information.

## PHYSICS B.A./B.S.

It is important that students planning to major in physics contact the Department of Phy sics prior to the start of their work in order that a coherent program can be planned with their ass igned adviser.
Students planning to transfer to PSU from community colleges orother universities are strongly advised to contact the Department of Physics well ahead of their proposed date of transfer so that a smooth transition, which avoids course duplication and untimely delays, can be accomplis hed. Students need to choose between the standard option, the environmental physics option, the engineering physics option, and the biomedicaloption.

## REQUIREMENTS

In addition to meeting the general University degree requirements, the student must meet the following minimal departmental course requirements:

## Standard Option

| Ph 201 | General Physics | 4 |
| :--- | :--- | :--- |
| Ph 202 | General Physics | 4 |
| Ph 203 | General Physics | 4 |
|  | or |  |
| Ph 211 | General Physics (with Calculus)I | 4 |
| Ph 212 | General Physics (with Calculus) | 4 |

Ph $213 \quad$ General Physics (with Calculus) 4
III
or
Ph $221 \quad$ General Physics (with Calculus) I 3
Ph 222 General Physics (with Calculus) 3 II
Ph 223 General Physics (with Calculus) 3
III With
Ph $214 \quad \mathrm{Lab}$ forPh 201 or Ph 211 or $\mathrm{Ph} \quad 1$
Ph $215 \quad$ Lab for Ph 202 or Ph 212 or $\mathrm{Ph} \quad 1$ 222 or Ph 232
Ph $216 \quad$ Lab for Ph 203 or Ph 213 or Ph 223 or Ph 233

Ph 311 Introduction to Modern Physics I 4
Ph 312 Introduction to Modern Physics 4 II
Ph $314 \quad$ Experimental Physics I 4
Ph 315 Experimental Physics II 4
Ph 316 Experimental Physics III 4
Ph 322 Computational Physics 4
Ph 424 ClassicalMechanics I 4

| Ph 426 | Thermodynamics and Statistical |
| :--- | :--- | :--- |
| Mechanics |  |$\quad 4$

Two courses in a related area of science or technology (minimum 6 credits total):
biology, geology, chemistry,
computer science, electrical
engineering, or physics
Subtotal: 101-104
Environmental Option

| Ph 201 | General Physics | 4 |
| :---: | :---: | :---: |
| Ph 202 | General Physics | 4 |
| Ph 203 | General Physics | 4 |
|  | or | 4 |
| Ph 211 | I |  |
| Ph 212 | General Physics (with Calculus) | 4 |
|  | II |  |
| Ph 213 | General Physics (with Calculus) III | 4 |
|  | or |  |
| Ph 221 | General Physics (with Calculus) | 3 |
| Ph 222 | General Physics (with Calculus) | 3 |
|  | II |  |
| Ph 223 | General Physics (with Calculus) | 3 |
|  | III |  |
|  | With |  |
| Ph 214 | Lab for Ph 201 or Ph 211 or Ph | 1 |


| Ph 215 | Lab for Ph 202 or Ph 212 or Ph 222 orPh 232 | 1 |
| :---: | :---: | :---: |
| Ph 216 | Lab for Ph 203 or Ph 213 or Ph 223 orPh 233 | 1 |
| Ph 311 | Introduction to Modern Phy sics I | 4 |
| Ph 312 | Introduction to Modern Physics II | 4 |
| Ph 314 | Experimental Physics I | 4 |
| Ph 322 | Computational Physics | 4 |
| Ph 426 | Thermody namics and Statistical Mechanics | 4 |
| Ph 431 | Electricity and MagnetismI | 4 |
| Ph 471/ESM | Physical and Human Dimensions | 4 |
| 471 | of Climate Change |  |
| Mth 251 | Calculus I | 4 |
| Mth 252 | Calculus II | 4 |
| Mth 253 | Calculus III | 4 |
| Mth 254 | Calculus IV | 4 |
| Mth 256 | Applied Ordinary Differential Equations | 4 |
| Mth 261 | Introduction to Linear Algebra | 4 |
| Stat 451 | Applied Statistics for Engineers and Scientists I | 4 |
| One year of general chemistry: |  |  |
| Ch 221 | General Chemistry I | 4 |
| Ch 222 | General Chemistry II | 4 |
| Ch 223 | General Chemistry III | 4 |
| Ch 227 | General Chemistry Laboratory |  |
| Ch 228 | General Chemistry Laboratory | 1 |
| Ch 229 | General Chemistry Laboratory | 1 |
| Choose two of the following courses: |  |  |
| Ph 315 | Experimental Physics II | 4 |
| Ph 316 | Experimental Physics III | 4 |
| Ph 411 | Introduction to Quantum Mechanics | 4 |
| Ph 424 | ClassicalMechanics I | 4 |
| Ph 432 | Electricity and MagnetismII | 4 |
| Ph 434 | Methods of Mathematical Physics | 4 |
| Ph 464 | Applied Optics | 4 |
| Ph 473 | Alternative Energies | 4 |
| Ph 490 | Cellular and Molecular Biophysics | 4 |
| Choose 12 credits of electives from the following: |  |  |
| Bi 211 | Principles of Biology: Biology of Cells | 4 |
| Bi 212 | Principles of Biology:The biology of organisms | 4 |
| Bi 213 | Principles of Biology:Evolution and ecology of living org anisms | 4 |
| Bi 214 | Principles of Biology Lab I | 1 |
| Bi 215 | Principles of Biology Lab II | 1 |
| Bi 216 | Principles of Biology Lab III | 1 |


| Bi 357 | General Ecology | 4 |
| :---: | :---: | :---: |
| Bi 476 | Population Ecology | 5 |
| Ch 360U | Origins of Life on Earth | 4 |
| Ch 426 | Instrumental Analysis | 4 |
| Ch 427 | Instrumental Analy sis | 4 |
|  | Laboratory |  |
| CE 371 | Environmental Engineering | 4 |
| ESM 220 | Introductionto Environmental | 4 |
| ESM 221 | Applied Environmental Studies: ProblemSolving | 4 |
| ESM 222 | Applied Environmental Studies: Policy Consideration | 4 |
| ESM 320 | Environmental Sy stems I | 4 |
| ESM 321 | Environmental Systems II | 4 |
| ESM 322 | Environmental Risk Assessment | 4 |
| ESM 324 | Environmental Systems | 2 |
|  | Laboratory II |  |
| ESM | Air Quality | 4 |
| 460/CE 488 |  |  |
| G 322 | Global Biogeochemical Cycles | 5 |
| G 351 | Introductionto Oceanography | 4 |
| G 426 | Numerical Modeling of Earth Systems | 4 |
| G 426L | Lab for G 426 | 0 |
| G 434 | Structural Geology and Tectonics | 5 |
| G 458 | Astrobiology | 4 |
| G 462 | Hills lope Materials and | 4 |
|  | Processes |  |
| G 476 | Earthquake Geology | 4 |
| Geog | Climate and Water Resources | 4 |
| 310U/Sci |  |  |
| 333 U |  |  |
| Geog 311U | Climatology | 4 |
| Geog | Climate Variability and Change | 4 |
| 312U/Sci |  |  |
| 334 U |  |  |
| Geog 314U | Severe Weather | 4 |
| ME 320 | Fluid Mechanics | 4 |
| ME415 | Advanced Topics in Energy | 4 |
|  | Conversion |  |
| ME426 | Solar Engineering | 4 |
| Ph | Weather | 4 |
| 333U/Geog |  |  |
| 333 U |  |  |

Subtotal: 103-106
See adviser for substitutions.

## Biomedical Option

Required physics courses:

| Ph 201 | General Physics | 4 |
| :--- | :--- | :--- |
| Ph 202 | General Physics | 4 |
| Ph 203 | General Physics | 4 |
|  | or |  |


| Ph 211 | General Physics (with Calculus) I | 4 |
| :---: | :---: | :---: |
| Ph 212 | General Physics (with Calculus) | 4 |
|  | II |  |
| Ph 213 | General Physics (with Calculus) | 4 |
|  | III |  |
|  | or |  |
| Ph 231 | General Physics I with Life | 4 |
|  | Science and Medical |  |
|  | Applications |  |
| Ph 232 | General Phys ics II with Life | 4 |
|  | Science and Medical |  |
|  | Applications |  |
| Ph 233 | General Physics III with Life | 4 |
|  | Science and Medical |  |
|  | Applications |  |
|  | With |  |
| Ph 214 | Lab for Ph 201 or Ph 211 or Ph | 1 |
|  | 221 or Ph 231 |  |
| Ph 215 | Lab for Ph 202 or Ph 212 or Ph | 1 |
|  | 222 or Ph 232 |  |
| Ph 216 | Lab for Ph 203 or Ph 213 or Ph | 1 |
|  | 223 or Ph 233 |  |
| Ph 311 | Introduction to Modern Physics I | 4 |
| Ph 312 | Introduction to Modern Physics | 4 |
|  | II |  |
| Ph 314 | Experimental Physics I | 4 |
| Ph 316 | Experimental Physics III | 4 |
| Ph 322 | Computational Physics | 4 |
| Ph 426 | Thermodynamics and Statistical Mechanics | 4 |
| Required non-physics courses: |  |  |
|  |  |  |
| Bi 211 | Principles of Biology: Biology of Cells | 4 |
| Bi 214 | Principles of Biology Lab I | 1 |
| Ch 221 | General Chemistry I | 4 |
| Ch 222 | General Chemistry II | 4 |
| Ch 223 | General Chemistry III | 4 |
| Ch 227 | General Chemistry Laboratory | 1 |
| Ch 228 | General Chemistry Laboratory | 1 |
| Ch 229 | General Chemistry Laboratory | 1 |
| Ch 334 | Organic Chemistry I | 4 |
| Ch 337 | Organic Chemistry Laboratory I | 2 |
| Mth 251 | Calculus I | 4 |
| Mth 252 | Calculus II | 4 |
| Mth 253 | Calculus III | 4 |
| Mth 254 | Calculus IV | 4 |
| Mth 256 | Applied Ordinary Differential | 4 |
|  | Equations |  |
| Mth 261 | Introduction to Linear Algebra | 4 |


| a) Courses particularly recommended for preprofessionals in biophysics, biomedical engineering, medical physics: |  |  |
| :---: | :---: | :---: |
| Ph 315 | Experimental Physics II | 4 |
| Ph 337 | Physics in Biomedicine | 4 |
| Ph 411 | Introduction to Quantum Mechanics | 4 |
| Ph 424 | Classical Mechanics I | 4 |
| Ph 431 | Electricity and MagnetismI | 4 |
| Ph 432 | Electricity and MagnetismII | 4 |
| Ph 451 | Electron Microscopy | 4 |
| Ph 464 | Applied Optics | 4 |
| Ph 490 | Cellular and Molecular | 4 |
|  | Biophysics |  |

b) Courses particularly recommendedfor pre-health care professionals:

| Bi 212 | Principles of Biology: The <br> biology of organis ms | 4 |
| :--- | :--- | :--- |
| Bi 213 | Principles of Biology: Evolution <br> and ecology of living organisms | 4 |
| Bi 215 | Principles of Biology Lab II | 1 |
| Bi 216 | Principles of Biology Lab III | 1 |
| Bi 301 | Human Anatomy and Physiology | 4 |
| Bi 302 | Human Anatomy and Physiology | 4 |
| Bi 303 | Human Anatomy and Physiology | 4 |
| Ch 335 | Organic Chemistry II | 4 |
| Ch 336 | Organic Chemistry III | 4 |
| Ch 338 | Organic Chemistry Laboratory II | 2 |
| Ph 337 | (nonmajors) |  |
| Ph 490 | Physics in Biomedicine | 4 |
|  | Cellular and Molecular | 4 |
|  | Biophysics |  |

Please see the undergraduate adviser to register for the following OHSU subs titute courses:

| RDTT 331 | Radiation Therapy Physics I | 3 |
| :--- | :--- | :--- |
| RDTT 430 | Radiation Therapy Physics II | 3 |

Subtotal: 101

| Engineering Physics Option |  |  |
| :---: | :---: | :---: |
| Ph 201 | General Physics | 4 |
| Ph 202 | General Physics | 4 |
| Ph 203 | General Physics or | 4 |
| Ph 211 | General Physics (with Calculus)I | 4 |
| Ph 212 | General Physics (with Calculus) II | 4 |
| Ph 213 | General Physics (with Calculus) III <br> With | 4 |
| Ph 214 | Lab for Ph 201 or Ph 211 or Ph 221 or Ph 231 | 1 |
| Ph 215 | Lab for Ph 202 or Ph 212 or Ph 222 or Ph 232 | 1 |


| Ph 216 | Lab for Ph 203 or Ph 213 or Ph 223 or Ph 233 | 1 |
| :---: | :---: | :---: |
| Ph 311 | Introductionto Modern Physics I | 4 |
| Ph 312 | Introduction to Modern Physics II | 4 |
| Ph 319 | Solid State Physics for Engineering Students or | 4 |
| Ph 413 | Introduction to Solid State Physics | 4 |
| Ph 314 | Experimental Physics I | 4 |
| Ph 315 | Experimental Physics II | 4 |
| Ph 316 | Experimental Physics III | 4 |
| Ph 322 | Computational Physics | 4 |
| Ph 426 | Thermodynamics and Statistical Mechanics | 4 |
| Ph 431 | Electricity and MagnetismI | 4 |
| Mth 251 | Calculus I | 4 |
| Mth 252 | Calculus II | 4 |
| Mth 253 | Calculus III | 4 |
| Mth 254 | Calculus IV | 4 |
| Mth 256 | Applied Ordinary Differential Equations | 4 |
| Mth 261 | Introduction to Linear Algebra | 4 |
| At least four of the following electives |  |  |
| Ph 401 | Research | 4 |
| Ph 402 | Independent Study | 4 |
| Ph 411 | Introduction to Quantum Mechanics | 4 |
| Ph 424 | ClassicalMechanics I | 4 |
| Ph 432 | Electricity and MagnetismII | 4 |
| Ph 434 | Methods of Mathematical Physics | 4 |
| Ph 440 | Physics of Solid State Devices | 4 |
| Ph 445 | Microelectronic Device Fabrication I | 4 |
| Ph 464 | Applied Optics | 4 |
| Ph 481 | Introduction to Nano(materials)Science and-Engineering | 4 |
| Ph 495 | Materials Physics: Structure and Physical Properties of Ordered and Disordered Condensed Matter | 4 |
| Three courses in a relatedarea of science or engineering (minimum 9 credits): |  |  |
|  | chemistry, computer science, electrical engineering, mechanical engineering, physics, or statistics | 9-12 |

Subtotal: 100-103

Courses taken under the undifferentiated grading option (pass/no pass) are not acceptable toward fulfilling department major requirements except for those major courses offered on a pas s/no pass basis only.

## PHYSICS MINOR

## REQUIREMENTS

To earn a minor in physics a student must complete 27 credits ( 9 credits of which must be taken in residence at PSU, and 12 to 15 credits of which must be upperdivision), to includethe following:

| Courses |  |  |
| :---: | :---: | :---: |
| Ph 201 | General Physics | 4 |
| Ph 202 | General Physics | 4 |
| Ph 203 | General Physics | 4 |
| Ph 211 | or General Physics (with Calculus) I | 4 |
| Ph 212 | General Physics (with Calculus) II | 4 |
| Ph 213 | General Physics (with Calculus) <br> III <br> With | 4 |
| Ph 214 | Lab for Ph 201 or Ph 211 or Ph 221 or Ph 231 | 1 |
| Ph 215 | Lab for Ph 202 or Ph 212 or Ph 222 or Ph 232 | 1 |
| Ph 216 | Lab for Ph 203 or Ph 213 or Ph 223 orPh 233 | 1 |
|  | Upper-division physics electives | $\begin{array}{r} 12- \\ 15 \end{array}$ |

## Subtotal: 27

A maximum of one-third of the courses taken under the undifferentiated grading option (pass/no pass) is acceptable toward fulfilling department minor requirements. Additional courses may be required as prerequisites.

## PHYSICS HONORS TRACK

## Adviser: Erik Sánchez

The Physics department's honors track is designed to challenge and enrich the educational experience of superior physics majors and, with a successful completion, recognize and honor their achievements. It is designed specifically for those students who plan to pursue graduate studies in physics or other disciplines that involve scientific research which is eitherexperimental or theoretical in nature. Participation in the track is elective and because honors studies involve a close mentoring relationship with faculty, students will need to coordinate their proposed research topic(s) with an appropriate faculty member.

## PHYSICS SECONDARY EDUCATION PROGRAM

Adviser: Andrew Rice
Students who plan to obtain a teaching license with an endorsement to teach physics at the high school level should complete a baccalaureate degree which includes at least 40 credit hours in physics.

## REQUIREMENTS

An acceptable course of study should include:

## Courses

Ph 201 General Physics 4
Ph $202 \quad 4$
Ph 203 General Physics 4
or
Ph 211 General Physics (with Calculus)I 4
Ph $212 \quad$ General Physics (with Calculus) 4
Ph $213 \quad$ General Physics (with Calculus) 4
III With
Ph $214 \quad$ Lab for Ph 201 or Ph 211 or $\mathrm{Ph} \quad 1$ 221 or Ph 231
Ph $215 \quad$ Lab for Ph 202 or Ph 212 or Ph 222 or Ph 232
Ph $216 \quad \mathrm{Lab}$ for Ph 203 or Ph 213 or Ph 223 or Ph 233

Ph 311 Introduction to Modern Physics I 4
Ph 312 Introduction to Modern Physics 4
Ph 314 Experimental Physics I 4
Ph 315 Experimental Physics II 4
Ph 316 Experimental Physics III 4
Ph 322 ComputationalPhysics 4
Ph 464 Applied Optics 4
Ph 426 Thermodynamics and Statistical 4 Mechanics

Other courses that may qualify should be discussed with the secondary education adviser.
Courses are to be taken for differentiated grades. A positive recommendation to the Graduate Teacher Education Program will depend on at least a Cgrade in all physics courses, as well as a cumulative 2.75 GPA.

## Graduate programs

The Department offers the degrees of Master of Arts and Master of Science in Physics and Ph.D. in Applied Physics. The M.A. and M.S. programs are designed to further the development of the student as a professional
physicist. Specific programs designed to meet the needs of the individual student are planned in consultation with the graduate advisers.
The department offers graduate courses in clas sical mechanics, quantummechanics, electromagnetism, statistical mechanics, physics of condensed matter, atmospheric physics, and biophysics. Current research areas in theoretical and experimental physics include: statistical physics, surface and materials physics (scanning tunneling microscopy, near-field optical microscopy,
AFM, electron microscopy), molecular biophysics and membrane biophysics (detection of life in extreme environments and transport in biological and artificial membranes), phy sics educational research, and global change science (climate change and atmospheric physics and chemistry).
The department also participates in the Earth, Environment, and Society PhD Degree Programin areas of climate change and policy.

## DEGREE REQUIREMENTS

Specific departmental requirements are listed below. The complete details of all M.A., M.S. and Ph.D. requirements are outlined in the Department of Physics Graduate StudentHandbook and on the web at www.pdx.edu/physics.

PHYSICS M.A./M.S.

## REQUIREMENTS

The programmust be approved by the student's adviser and must include a minimum of 45 graduate credits in science, including not fewer than 30 credits in physics. These 30 credits in physics must be in 500 - or 600 - level courses as follows for thesis and non-thesis options:

## Thesis Option

| Three of the following 600-levelcourses: |  |  |
| :--- | :--- | ---: |
| Ph 617 | QuantumMechanics | 4 |
| Ph 624 | ClassicalMechanics | 4 |
| Ph 631/ECE | Electromagnetic Fields and | 4 |
| 635 | Interactions |  |
| Ph 664 | StatisticalMechanics | 4 |
|  | And | 4 |
| $\operatorname{Ph~507~}$ | Seminar | 3 |
|  | Electives | 24 |
| $\operatorname{Ph~503~}$ | Thesis | 6 |

Subtotal: 45

## Non-Thesis Option

Three of the following 600-levelcourses:

| Ph 617 | QuantumMechanics | 4 |
| :--- | :--- | :--- |
| Ph 631/ECE | Electromagnetic Fields and | 4 |
| 635 | Interactions |  |


| Ph 624 | ClassicalMechanics | 4 |
| :--- | :--- | ---: |
| Ph 664 | StatisticalMechanics | 4 |
|  | And |  |
|  |  |  |
| Ph 507 | Seminar | 3 |
|  | Electives | 24 |
| Ph 504 | Cooperative | 6 |
|  | Education/Internship |  |
| Ph 506 | or |  |
|  |  |  |
|  |  | Special Projects |

Typically, a thesis involves research, Cooperative Education/Internship involves relevant student experiences obtained in industry or government, and a project involves review of the literature in a certain area of physics. In all cases, a written report, a presentation, and final oral exam are required.

## APPLIED PHYSICS PH.D.

## REQUIREMENTS

All doctoral students must earn a minimum of 81 credits beyond the bachelor's degree. Candidates forthe Ph.D. in Applied Physics musts atisfy requirements related to coursework, seminar, and a dissertation, including a minimum of 69 credits as follows:

## Courses

Ph 585
Experimental Methods in
Applied Physics
Ph 617 QuantumMechanics 4
Ph 618 QuantumMechanics 4
Ph $624 \quad$ ClassicalMechanics 4
Ph 631/ECE Electromagnetic Fields and 4
635
Ph 632/ECE Interactions

636
Ph 607
Ph 603
Electromagnetic Fields and 4
Interactions
Seminar
Dissertation
Electives12

Electives:(all from one specialty area)
Subtotal: 69
Approvedelectives in the three specialty areas of Nanoscience and Materials Physics, Atmospheric Physics, and Biophysics are found in the Physics Graduate Student Handbook and on the web at www.pdx.edu/physics. Candidates for the Ph.D. in Applied Physics are required to pass the comprehensive examination, a prospectus examination, and write and orally defend a dis sertation.

## Pre-professional Programs

503-725-3822, Suite 360 FariborzMaseeh Hall (FMH)

Portland State offers courses which meet the preprofessional requirements of professional schools within Oregon and, in most cases, the requirements of out-of-state professional schools as well. The program schedules in this section are typical and will vary in individual cases. The majority of pre-professional programs are based on the graduation requirements of other institutions. All preprofessional students should check with their as signed advisor to keep current on all recent changes and remaining requirements.

## Pre-Professional Health Programs

For advisor information, please go to www.pdx.edu/advising/health-science-and-the-earthpathway.

Professional advisors in the Health, Science, and the Earth advising pathway administer programs designed to support students' efforts to prepare for and apply to professional health programs. Pre-professional health programs at Portland State University are not majors. Rather, they are programs in which students take advantage of advising, coursework and resources all designed to support and guide students' efforts to apply to undergraduate and graduate health programs offered at other in stitutions. There are two types of pre-professional health programs at Portland State - 1) trans fer programs, and 2) bachelor's degree programs.

Transfer programs are those in which students complete a set of prerequisite courses at Portland State and then transferto undergraduate professional health sciences programs at other institutions to complete their bachelor's degrees. The students' focus at Portland State is on fulfilling the admissions requirements of receiving institutions. Transfer programs include the following:

MedicalLaboratory Science
DentalHygiene
Nursing

## Radiation Therapy

Students choosing to continue at PSU, rather than pursue a pre-professional transfer programshould meet with their as signed advis or within the Health, Science, \& the Earth advising pathway to determine PSU graduation requirements.
Bachelor's degree programs are those designed to prepare students for masters and doctoral programs in the health sciences that require or recommend completion of a bachelor's degree prior to entry. However, pre-professional bachelor's degree programs at Portland State are not
majors. Thus, students must a) selecta major and fulfill Portland State's graduation requirements, and b) fulfill the prerequisite coursework required by the professional graduate programs to which they planto apply. Majors commonly selected by pre-professional health students include biology, chemistry, public health studies, science, social science and psychology. However, a studentcan select any major offered at Portland State, as long as they complete both Portland State's graduation requirements and those of the receiving professional institutions. Professional schools do not preferone major over another. They do look for students whoperform well in prerequisite coursework and who are broadly educated; this can be accomplished with any major.

Profess ional health sciences programs that require or recommend that applicants earn a bachelor's degree before matriculating include the following:

Allopathic and Osteopathic Medicine
Chiropractic Medicine
Dentistry
Naturopathic Medicine
Occupational Therapy
Optometry

## Pharmacy

PhysicalTherapy
Physician Assistant
Veterinary Medicine
A typical pre-professional health program, whether it is a trans fer or a bachelor's degree program, includes but is not limited to coursework in mathematics, biology, chemistry, physics, English composition, and social science.
However, coursework varies, depending on the admis sions requirements of the institutions granting the professional degrees. It is essential that a student's academic program be planned with an advisor in the Health, Science, and the Earth pathway.
PSU's pathway advisors work closely with students to facilitate their ability to plan coursework and activities strategically; to integrate personal, academic, and career goals; to de velop the ability to evaluate options and make decisions; and to be aware of the available resources across campus that can support their efforts to gain admission to professional health sciences programs. Advisors also provide students with guidance on selecting a major, preparing for graduate admissions tests such as the MCAT and GRE, organizing letters of evaluation, and writing the personal statement for admis sions applications.

## POSTBACCALAUREATE PRE-MEDICAL PROGRAM

Forstudents who already have a bachelor's degree but are lacking the specific science prerequisites for medical school, PSU offers a loosely structured postbaccalaureate program. The timeline for completion varies based on the individual student's previous preparation. At least two years is a common timeline for those without significant prior cours ework in the sciences. The two year timeline allows for a balanced (though still challenging) schedule as well as more time to gain clinical exposure, demonstrate long-termservice in the field, and include study time for the MCAT. Coursework may include year-long sequences in general chemistry, biology, organic chemistry, and physics, as well as single termcourses in genetics and biochemistry. It is possible to further expedite the completion of pre-med courses with previous math cours ework or utilizing summer accelerated sequences. Postbac students will work with their Health, Science, \& the Earth pathway advisor to determine a course plan that works best with their goals.

The postbaccalaureate pre-medical programis not a certificate program. Many postbaccalaureate pre-medical students do, however, complete a degree in science (science is an interdisciplinary major at Portland State) while completing prerequisite course work for medical school. Most students need only add two to three classes to the pre-medical coursework in order to finish the degree. Pursuing a second degree while working on preprofessional coursework often enables postbaccalaureate students to receive fin ancial aid for a longer period of time. For more information, contact an advisor in the Health, Science, and Earth advising pathway.

## POSTBACCALAUREATE PRE-DENTAL PROGRAM

Forstudents who already have a bachelor's degree but are lacking the specific science prerequisites for dental school, PSU offers a loosely structured postbaccalaureate program It typically takes postbaccalaureatestudents who are lacking all of the science prerequisites for dental school at least two years to complete the core coursework. Courses can be planned in a variety of ways. Postbaccalaureate predental students will work with their Health, Science, \& the Earth pathway advisor to develop a plan for completing the pre-dental coursework as well as gain relevant experiences prior to applying to dental school.
The postbaccalaureate pre-dental programis not a certificate program. Many postbaccalaureate pre-dental students do, however, complete a degree in science (science is an interdisciplinary major at Portland State) while completing prerequisite coursework for dental school. Pursuing a second degree while working on pre-
profes sional coursework often enables postbaccalaureate students to receive financial aid for a longer period of time. For more information, contact an advisor in the Health, Science, and the Earth pathway.

## K-12 Teacher Preparation

Portland State University educates prospective K-12 teachers in the College of Education, through the Graduate TeacherEducation Program(GTEP) and the Special Educator Program(SPED). The Special Educator Program prepares teacher candidates to work as Special Education Teachers in Pre-K through grade 12 settings and results in the teacher candidate receiving the Oreg on Preliminary Teaching License with added Special Education Generalist Endorsement and option to complete the MA or MS in Special Education. Both GTEP and SPED are split into separate tracks to emphasize either elementary (K-6/7-8 self-contained) or secondary (middle/high school) education, and both result in a master's degree (Master of Education or Master of Special Education) and an initial teaching license.
Undergraduates at Portland State University may prepare for competitive admissions by consulting with appropriate advisers, by achieving high academic standards in the recommended and required courses for specialization, and in courses in liberal arts, and by documenting successful experience with children in public schools. For students interested in the BA/BS in Special Education degree and licensure program, please visit https://www.pdx.edu/sped/sped-undergraduate. Passing scores on teacherexams mandated by the Oregon Teachers Standards and Practices Commission (TSPC) are also required forentry into the GTEP.

## PRE-EDUCATION UNDERGRADUATE ADVISING

503-725-3822,
Suite 360 FariborzMaseehHall (FMH)
Advisors: B. Alberts andE. Benner
CHILD, YOUTH, AND FAMILY STUDIES MAJOR ADVISING

503-725-3822
Suite 360 FariborzMaseeh Hall (FMH)
Advisors: K. Utschig andE. Benner

## EARLY CHILDHOOD AND ELEM ENTARY EDUCATION

Students who want to be elementary teachers choose from a wide range of majors to complete their undergraduate degrees. Pre-Education advisors have traditionally recommended interdisciplinary majors - such as Arts and Letters, Social Science, General Science, and Liberal
studies - because they can include multiple subjects that are highly relevant to the elementary curriculum. However, specific disciplinary majors can als obe fitting for the goal of progressing into GTEP. Such disciplines include (but are not limited to) English or History (especially those wishing to teach at the upperelementary level),
Psychology, and Child, Youth, and Family Studies.
Prospective elementary teachers should consult with a PreEducation Advisor in the advising office.

## SECONDARY (MIDDLE/HIGH SCHOOL) EDUCATION

Prospective middle and high school teachers may receive general introductory pre-professional advising with a PreEducation Adviser; however, subsequent advising for presecondary education should be with the academic advisor for the secondary education content area they wish to teach. These specialized advisors are familiar with all GTEP admission requirements for their res pective content areas, and the College of Education relies on their recommendations to determine whether an applicant has sufficient understanding of the subject matter they wish to teach. Secondary Education content advisors can be found at
https://www.pdx.edu/education/academics/programs/gradu ate/graduate-teacher-education-program/admis sions

Academic majors and their respective secondary endorsements are as follows: biology (biology and general science); physical education (physicaleducation); history, anthropology, sociology, philosophy, political science, geography, and economics (social studies); health (health); mathematics (mathematics); English (English language arts); art (art); world languages and literatures (foreign language); music (music); chemistry (chemistry); physics (physics); business and economics (business); drama (drama); speech (s peech).
Additional information is available online, or by contacting GTEP admissions at (503) 725-4619.

## SPECIAL EDUCATION

All prospective special educators, whether they wish to teach special education at the elementary or secondary level, should consult with a pre-education advisor.

## GRADUATE TEACHER EDUCATION PROGRAM

Any current or prospectivePSU Students who are considering application to GTEP at PSU should attend one of the College of Education's regularly held information ses sions for prospective applicants. A current schedule of upcoming information sessions is available online, along with an online form to regis ter to attend a specific session. For additional information, pleasecontact the College of Education (askcoe@pdx.edu; 503-725-4619).
PREPARATORY COURSEWORK
Early childhood and elementary educators:
Required:
Lib 428 Children's Literature, K-53
Mth 211 Foundations Of Elementary ..... 4Mathematics IMth 212 Foundations Of Elementary4Mathematics II
Mth 213 Foundations Of ElementaryMathematics III4
Recommended:
Art $312 \quad$ Art in the Elementary School ..... 4
CI 432 Computer Applications for the ..... 3
Ed 420 Introduction to Education and ..... 4 Society
Mus 381 Music forElementary Teachers ..... 4
Psy 311U Human Development ..... 4 ..... 3
SpEd 418 Survey of Exceptional Learners
(please see the Minor in Elementary Education)
Middle, junior, and high school educators:In addition to a strong liberal arts education, all studentsshould complete the requirements for their major in theendorsement area of their choice.
Required:
Psy 311U Human Development ..... 4
Recommended:
Psy 311U Human Development ..... 4 ..... 3
Classroom ..... 4
Society

## INTEGRATED SCIENCE

Advisor: Dr. Rolf Koenenkamp, Physics
The integrated science endorsement is valid for teaching middle school, intermediate school, high school integrated science, or high school earth science. See the other secondary endorsements for a high school biology, chemistry, or physics content focus. Coursework highlighted here is beneficial preparation for those intending to teach in states that have adopted the Next Generation Science Standards (Oregon included). Students who wish to obtain the integrated science endorsement under an interdisciplinary general science major should be aware that the integrated science endorsement requires additional science courses bey ond the coursework required for a major in general science. Courses pertaining to all of the Earth/Space, Life, and Physical Science Content Standards are required. Guidelines for a course of study for the integrated scienceendorsementincludethe following.

## Science Requirements

Earth/Space Content Area: ( $\mathbf{2 0}$ credits)
Lower division geology with
labs/field studies Upper-division earth science courses

Upper-divis ion earth science courses: distributed among geology, paleontology, geomorphology, ocean ography, hydrology, weather and climate, planetary science, astronomy.

## Life Science Content Area: ( $\mathbf{1 5}$ credits)

Bi $211 \quad$ Principles of Biology: Biology of 4
Bi 212 Principles of Biology:The 4
biology of organis ms
Bi 213
Principles of Biology:Evolution 4
and ecology of living organisms
with required 1-credit labs (Bi214, Bi 215, and Bi 216).
Physical Science Content Area: ( $\mathbf{1 5}$ credits)
200-level General Physics or
General Chemistry
with labs
Upper Division Science Electives ( $\mathbf{2 0}$ credits)
Upper-division electives
Upper-level division electives in Earth/Space, Life Science, and/or Physical Science Content areas: May be completed in one department. Minimum of 20 UD electives with
science (chemistry, physics, geology, biology, environmental science) or math prerequisites.

| Mathematics and Statistics Content Area: ( $\mathbf{1 2}$ credits) |  |  |
| :---: | :--- | :--- |
| Stat 243 | Introduction to Probability and | 4 |
|  | Statistics I |  |

Eight credits from:
Mth 111 Introductory College 4
Mth 112 Introductory College 4
Mathematics II
Mth 251 Calculus I
Mth 211 Foundations Of Elementary 4
Mth 212 Foundations Of Elementary 4
Mathematics II
Mth 213 Foundations Of Elementary
Subtotal: 82

## BASIC SOCIAL STUDIES

Advisor: K. Constable

Students who major in social science (or in anthropology, economics, geography, history, political science, psychology, or sociology) and wish to teach social studies in secondary schools are recommended to include the following courses in their undergraduate program:
Student must complete a minimum of 12 credits each in History and Geography and 8 credits each in Economics and Political Science to receive a departmental recommendation to the GTEP. For further guidance please contact the advisor listed above.

Courses are to be taken for differentiated grades. Students must have at leasta 3.00 GPA in the recommended courses and must earn at leasta B-in each course.
Equivalent courses sometimes are accepted in substitution for certain of those specified, upon prior approval of the social studies secondary advisor.

## Education Minors

For more information about any of theeducation minors, contactPre-teacherEducation Advisors, FMH360, 503-725-3822, sipathway@pdx.edu.

## ELEMENTARY EDUCATION MINOR

The Minor in Elementary Education is intended for students who plan to enter a graduate teacher education programand be licensed in Early Childhood/Elementary Education. While the minor is not a requirement for admission to the PSU Graduate TeacherEducation Program(GTEP), it does include all the prerequisites for admis sion to the program. Students seeking a license for early childhood and elementary education must complete a graduate-level licensure program. The College of Education provides the teacher licens ure as part of the GTEP.

## REQUIREMENTS

| Language Arts (7 credits) |  |  |
| :---: | :---: | :---: |
| Lib 428 | Children's Literature, K-5 | 3 |
| Ling 233 | Language and Mind | 4 |
| Sciences (8 credits) |  |  |
| G 355 | Earth and Space Sciences for | 4 |
|  | Elementary Educators |  |
| Sci 311U | Teaching Everyday Science | 4 |
| Math (12 credits) |  |  |
| Mth 211 | Foundations Of Elementary Mathematics I | 4 |
| Mth 212 | Foundations Of Elementary | 4 |
|  | Mathematics II |  |
| Mth 213 | Foundations Of Elementary | 4 |
|  | Mathematics III |  |


| Education (7 credits) |  |  |
| :---: | :---: | :---: |
| Ed 420 | Introduction to Education and Society | 4 |
| SpEd 418 | Survey of Exceptional Learners | 3 |
| Social Studies (8 credits) |  |  |
| Psy 311U | Human Development | 4 |
| Soc 337U | Prejudice, Privilege, and Power | 4 |
| Fine and Performing Arts (8 credits) |  |  |
| Art 312 | Art in the Elementary School | 4 |
| Mus 381 | Music for Elementary Teachers | 4 |
| Health (4 credits) |  |  |
| PHE 250 | Our Community:Our Health or | 4 |
| PHE 365 | Health Promotion Programs for Children and Youth | 4 |

The total may vary depending on the transfer of community college equivalent courses which carry, in some cases, fewer credits. A minimum of 18 credits must be upper-division. Only grades of C- or above may be counted toward these requirements. Students musttake all course work for differentiated grades. At least 16 credits must be in residence at PSU. A minimum cumulative GPA of 2.5 in coursework is required.
Subtotal: 54

## ELEMENTARY EDUCATION SCIENCE MINOR

The Minor in Elementary EducationScience is intended for students who plan to enter a graduate teacher education programand be licensed in Early Childhood/Elementary Education. While the minor is not a requirement for admis sion to the PSU Graduate Teacher Education Program(GTEP), it does include allthe prerequisites for admission to the program. Students seeking a license for early childhood and elementary education mustcomplete a graduate-level licens ure program. The Graduate School of Education provides the teacher licens ure as part of the GTEP .

## REQUIREMENTS

## Minor Concentration Options

Choose 2 courses fromone concentration.

## Anthropology

| Anth 101 | Introductionto Biological | 4 |
| :---: | :--- | :---: |
| Anth 102 | Anthropology <br> Biology <br> Bi 201 | Fundamentals of Biology: Cells, <br> Genes and Heredity |
|  | With | 4 |
| Bi 204 | Fundamentals of Biology <br> Laboratory: Cells, Genes and <br>  | 1 |
|  | Heredity |  |


| Sci 343 U | Columbia Basin Plant Communities | 4 |
| :---: | :---: | :---: |
| Bi 201 and Bi 204 are required forthis option. |  |  |
| Chemistry |  |  |
| Ch 104 | Introductory Chemistry I | 4 |
|  | With |  |
| Ch 107 | Introductory Chemistry | 1 |
|  | Waterin the Environment I |  |
| Sci 335U | - ${ }^{\text {or }}$ ater in the EnvironmentI | 4 |
| Sci 336U | Water in the Environment II | 4 |
| Ch 104 and Ch 107 are required for this option. |  |  |
| Geography |  |  |
| Geog 210 | PhysicalGeography | 4 |
| Geog 311U | Climatology | 4 |
| Geog 314U | Severe Weather | 4 |
| Geog 345U | Resource Management | 4 |
| Geog 368U | United States and Canada | 4 |
| Geog 210 is required forthis option. |  |  |
| Geology |  |  |
| G 201 | Dy namic Earth: Interior | 3 |
| G 204 | Geology Laboratory | 1 |
| G 341U | Geology of the Oregon Country | 4 |
| G 344U | Geology and the National Parks | 4 |
| G 355 | Earth and Space Sciences for Elementary Educators | 4 |
| G 430 | Life of the Past | 4 |
| G 355 is required forthis option. |  |  |
| Physics |  |  |
| Ph 101 | Essentials of Physics | 4 |
| Ph 102 | Essentials of Physics | 4 |
| Ph 361U/Sci 315U | General Astronomy I | 4 |
| Sci 316U/Ph | General Astronomy II | 4 |
| 362U |  |  |
| Ph 101 is required forthis option. |  |  |
| Core Courses |  |  |
| Mth 211 | Foundations Of Elementary | 4 |
|  | Mathematics I |  |
| Mth 212 | Foundations Of Elementary Mathematics II | 4 |
| Mth 213 | Foundations OfElementary | 4 |
|  | Mathematics III |  |


| Sci | NaturalScience Inquiry | 4 |
| :--- | :--- | ---: |
| $201 /$ UnSt |  |  |
| 286 | or | 4 |
| UnST 286 | Natural Science Inquiry | 4 |
| Sci 311U | Teaching Everyday Science | 4 |
| UnSt 421 | Capstone | $1-6$ |
| Lib 428 | Children's Literature, K-5 | 3 |
|  | Two classes froma <br> concentration listed below | $8-9$ |

## SECONDARY EDUCATION MINOR

The Minor in Secondary Education is intended for students who plan to enter a graduate teacher education program and be licensed in Secondary Education. Theminor is not a requirement foradmission to thePSU Graduate Teacher Education Program(GTEP), and students must also complete the content courses required by the department for the subject they plan to teachto apply to GTEP. Students seeking a license for secondary education must complete a graduate-level licensure program.

## REQUIREMENTS

## Core Courses

| Ed 420 | Introduction to Education and | 4 |
| :--- | :--- | :--- |
| CI 432 | Society <br> Computer Applications for the | 3 |
|  | Classroom |  |
| Psy 311U | Human Development | 4 |
| Soc c 337 U | Prejudice, Privilege, and Power | 4 |
| SpEd 418 | Survey of Exceptional Learners | 3 |

## Hectives ( $\mathbf{7 - 1 0}$ credits):

| (choose 2 classes) |  |  |
| :---: | :---: | :---: |
| Anth 315U | American Culture or | 4 |
| BSt 302U | The Contemporary African American Experience or | 4 |
| ChLa 301U | Chicano/Latino Communities | 4 |
| CFS 385U | Working with Diverse Families or | 4 |
| CFS 390U | Sex and the Family | 4 |
| Lib 429 | Young Adult Literature | 3 |
| Phl 331U | Philosophy of Education | 4 |
| Psy 345 | Motivation or | 4 |
| Psy 346 | Learning | 4 |
| SpEd 460 | Outdoor Education/Recreation With Persons With Dis abilities | 6 |
| WS 301 | Feminisms:Theories and Analyses | 4 |


| WS 360U | Or <br> Introduction to Queer Studies <br> Or adviser approved elective |
| :--- | :--- |

Subtotal: 25-28
The total may vary depending on the transfer of community college equivalent courses which carry, in some cases, fewercredits. A minimum of 18 credits must be upper-division. Only grades of C - or above may be counted toward these requirements. Students must take all coursework for differentiated grades. At least 16 credits must be in residence at PSU. A minimum cumulative GPA of 2.5 in coursework is required. Students must also complete the required content courses for the subject they plan to teach to apply to GTEP.

## SPECIAL EDUCATION MINOR

The Minor in Special Education is intended for students who plan to enter a graduate teacher education program and be licensed to teach Special Education. While the minor is not a requirement for admission to the PSU College of Education, Special Education Program(SPED), it does include all the prerequis ites and highly recommended courses for admis sion to the program. Students seeking a license for teaching s pecial education must complete a graduate-level program. The Graduate School of Education recommends students for teacher licensure at the completion of the Special Education Program.

## REQUIREMENTS

| Core Courses |  |  |
| :---: | :---: | :---: |
| Psy 311U | Human Development | 4 |
| Mth 211 | Foundations Of Elementary | 4 |
|  | Mathematics I |  |
| Mth 212 | Foundations Of Elementary | 4 |
|  | Mathematics II |  |
|  | or |  |
| Mth 213 | Foundations Of Elementary | 4 |
|  | Mathematics III |  |
| CI 432 | Computer Applications for the | 3 |
|  | Classroom |  |
| Ed 420 | Introduction to Education and | 4 |
|  | Society |  |
| SpEd 410 | Historical and Contemporary | 3 |
|  | Issues in Dis ability Studies |  |
| SpEd 417 | Introduction to Special Education | 4 |
| SpEd 418 | Survey of Exceptional Learners | 3 |
| SpEd 460 | Outdoor Education/Recreation | 6 |
|  | With Persons With Disabilities |  |
| Elective (choose one class): (2-4 credits) |  |  |
| G 355 | Earth and Space Sciences for | 4 |
|  | Elementary Educators |  |
| Psy 460 | Child Psychology | 4 |


| Psy 461U | Psychology of Adolescence and <br> Early Maturity | 4 |
| :--- | :--- | ---: |
| Sci 311U | Teaching Everyday Science | 4 |
| SpEd 455 | Working With LEP Children | 2 |
| SpHr 365U | Who Have Special Needs | Survey of Speech, Language, and <br> Hearing Disorders |
| SpHr 372U | Speech and Language |  |
|  | Developmentin Children | 4 |

The total may vary depending on the transfer of community college equivalent courses which carry, in some cases, fewer credits. A minimum of 18 credits must be upper-division. Only grades of C - or above may be counted toward these requirements. Students must take all coursework for differentiated grades. At least 16 credits must be in residence at PSU. A minimum cumulative GPA of 2.5 in coursework is required.
Subtotal: 41-43

## Pre-Law Preparation

## Pre-Law Preparation

ForLiberal Arts and Sciences students:
R. Kevin Hill, Philosophy, 503-725-3594, hillrk@pdx.edu
For Urban and Public Affairs students:
Chris Shortell, Political Science, 503-725-3920, shortell@pdx.edu
Law schools in the United States, unlike medical, dental, and other professional schools, generally do not require specific pre-law majors or particular courses of study in preparation for law school. Pre-law students are generally free to select their own undergraduate programs (there is no "pre-law" major as such), but they are advised to choose broad cultural fields in which they have keen intellectual interests, such as economics, history, literature, mathematics, philosophy, political science, science, or sociology, to suggestonly some examples. Business adminis tration and criminology and criminal justice, when strongly supplemented with work in arts and letters, science, or social science, are als o suitable. Law schools do recommend that the prospective law student acquire a broad liberal education providing a sound basic understanding and appreciation of arts and letters, science, and socialscience.

All three Oregon law schools, Lewis \& Clark, Willamette, and the University of Oregon, and the major law schools in other states, now require that applicants for admission have a bachelor's degree. Valuable information about pre-law study and law school admis sions can be found on the Law School Admis sion Council's websiteat http://www.lsac.org.

## 3+3 Accelerated Baccalaureate and Juris Doctor Agreements

PSU maintains 3+3 Accelerated Baccalaureate and Juris Doctor agreements with Lewis and Clark Law School and Willamette University College of Law. These programs are res tricted to certain undergraduate majors and allow for a student to complete a B.S. or B.A. degree at PSU and a law degree in six years.

## Preparing for Law School

Students are cautioned not to have a large number of ungraded or pass/no pass credits. Law schools also advise against concentration in courses given primarily as vocational training. Whatever the undergraduate program, pre-law students should develop as fully as possible the ability to read with understanding, to think logically, and to express themselves clearly and cogently in written and oral work. The importance of analytical skills in dealing with concepts, abstract ideas, and complex fact situations, and of communications skills, cannot be overemphasized, for lawyers must be able to research, analyze, and communicate.
And sincelaw is a part of the larger social order, the prelaw student should seek to understand the political, social, economic, and cultural institutions within which the legal systemfunctions. As illustrative of specific subjects (with PSU course numbers) which may be helpful to ward that end, the following are suggested with a reminder that they are not prerequisites for law school admis sion: introductory economics (Ec 201, Ec 202); ethics (Phl 308U, Phl 445, Phl 446, Phl 447); U.S. history (Hst 201, Hst 202, Hst 203); American constitutional history (Hst 447, Hst 448, Hst 449); political theory (PS 208, PS 483); constitutional interpretation, constitutional law, the judicial process (PS 221, PS 421, PS 422, PS 423, PS 424); criminology and criminal justice (CCJ 420, CCJ 440, CCJ 460 and CCJ 310); ps ychology (Psy 204); and general sociology (Soc 200). In addition, many law schools recommend taking a course in accounting principles. PSU does offer a Law \& Legal Studies minor for those who wish to concentrate their study in the area of law, but should note that this is not required for admission to law school.

Completion of the Law School Admis sion Test(LSAT), administered nationally by the Law School Admis sion Council, is required by nearly all law schools. You can find information about the exam, and about the law school admis sions process, at www.ls ac.org. The examis offered four times each year, but should be taken at the earliest possible date in the student's senior year or as early as their late junior year. According to the Law School Admis sions Council, the LSAT" is designed to measure skills that are considered es sential for success in law school: the reading and comprehension of complextexts with accuracy and insight; the org anization and management of information and the ability to draw reasonable inferences fromit; the
ability to think critically; and the analysis and evaluation of the reasoning and arguments of others."It does nottest knowledge of specific subjects, and is in no sense a testof knowledge about law. There is no standard "passing s core" on the test, for each law school makes its own evaluation of an applicant's admis sibility, using the LSAT score, GPA (grade point average) and such other factors as it deems relevant.
Competition for admission to law schools can be very keen; thus high grade point averages and high LSAT scores are very desirable. Many law schools use the LSAT score and the GPA in computing a total numerical score which constitutes one important factor in determining admis sibility. In such a computation a higher score on the LSAT can help to offset a lower GPA or vice versa. Although the LSAT may be repeated, it is generally advisable to prepare for the test as if it can only be taken once. Retakes should be reserved for situations where you are confident that you can increase your score. Information concerning the exact test dates is available fromthe Law School Admis sion Council's website. Students interested in attending law school are strongly encouraged to meet with one of the pre-law advis ors listed above for more specific guidance about the application process.

## Psychology

317 Cramer Hall (CH)
503-725-3923
www.pdx.edu/psychology

- B.A., B.S.
- Minor
- M.A.,M.S.
- Ph.D. in Applied Ps ychology


## Undergraduate programs

The programin psychology has been planned with the idea that all students, regardless of major, will have to solve significant psychological problems in their relations with others, at home and at work, in their personal decisions, and in theirefforts to understand the problems and processes of society. The programserves students intending to do professional work in the field; liberal arts majors who are interested in ps ychology as part of a liberal arts education; and students of other social sciences or in a professional field such as business, education or medicine who seek a working knowledgeof psychological principles.

## DEGREE MAPS AND LEARNING OUTCOMES

To view the degree maps and expected learning outcomes for Ps ychology's undergraduate degrees, go to www.pdx.edu/academic-programs/a-z.

## ADMISSION REQUIREMENTS

Admis sion to the department is based on general admis sion to the University. See Admis sions Requirements (p. 8) for more information.

## PSYCHOLOGY B.A./B.S.

## REQUIREMENTS

The major in psychology requires a minimum of 60 credits in the field. Students must complete the required courses in statistics before taking any 400-levelcourse or any course with statistics as a prerequisite.
All students majoring in ps ychology, especially those that are considering graduate work in psychology, are encouraged to plan their programwith an advisor fromthe Department of Psychology no later than the beginning of their first term of juniorstanding.

All psychology majors are strongly encouraged to participate in the advising process, which includes a Group Orientation session, peer mentoring, and faculty advising. Information about the psychology advising programis available on the Psychology Department website.

It is recommended that freshmen not enroll in psychology courses unless they have a B average ( 3.00 GPA ) or above in high school.
In addition to meeting the general University degree requirements, the student must meet the following requirements for major:

| Stat 243 | Introduction to Probability and Statistics I | 4 |
| :---: | :---: | :---: |
|  | And |  |
| Stat 244 | Introduction to Probability and Statistics II | 4 |
|  | or |  |
| Stat 243 | Introduction to Probability and Statistics I | 4 |
|  | And |  |
| Psy 320 | Social Science Research | 4 |
|  | Methods II |  |

or

Soc 396 Social Research Methods, Social Statistics
And

Psy $320 \quad$ Social Science Research 4 Methods II

Psy $200 \quad$ Psychology as a Natural Science 4
Psy $204 \quad$ Psychology as a SocialScience 4
Psychology elective200-level or 4 above (including 399-409)
Psy 321 Research Methods in Psychology 4
Psy 410-498 16
Additionalupperdivision 20
ps ychology courses (300-or 400-
level, excluding 401-409)
All majors are encouraged to begin their work in statistics as soon as possible in preparation for Psy 321 , which is a prerequisite for many of the upper-division courses.

## Human Diversity Requirement

Besides taking courses in a range of subjects in psychology, majors are also required to take a course in human diversity. To fulfill this requirement students can choose to take any 300-or 400-level class in the following subjects: Black Studies, Chicano/LatinoStudies, Indigenous Nations Studies, and Women's Studies, or any of the following classes:
Anth 318U Asian American Experience 4
Anth 426 Transnationalismand Migration 4
Anth 432 Gender, Sex, and Sexuality in 4
Anthropological Perspective
Comm 415 Problems of Intercultural 4
Communication
CR 312 InterculturalConflict Resolution 4
Psy 310U Psychology of Women 4
Psy $410 \quad 4$
Psy $410 \quad 4$
Psy $410 \quad$ Native American Psychological 4
Psy $425 \quad$ Psychology of Black Manhood in 4
Psy $426 \quad$ Psychology of Stigma \& Social 4
Inequality
Psy 428 Diversity, Prejudice and
Intergroup Relations
Psy 429 The Psychology of Race \&
Gender in Sport
Psy 431U Psychology of Men and
Masculinities
Development \& Education of
African-Diaspora Children \&
Youth
Psy 463
Development and Education of
Psy $469 \quad$ Psychology of Human Sexuality
Psy 470 Diversity in the Workplace 4
Soc 337U Prejudice, Privilege, and Power 4
Soc 344U Genderand Sexualities 4

Soc 423 Stratification 4
Soc 427 Genderand Work 4
Soc 430 Hate Crimes 4
Soc 444 Race, Ethnicity, and Nationality 4
Soc 446 Immigrants in America 4
Soc $452 \quad$ Education and Equality: 4
Comparing the US, Asia, Europe
Soc 463 Global Inequalities and Health
The list above is not comprehensive; students can also use courses not included here with advisor approval.
Subtotal: 60
All courses submitted to satisfy the requirements for a major in psychology, including the mandatory math courses, must be passed with a gradeof C - or above. Courses taken under the undifferentiated grading option (pass/no pass) will not be accepted toward fulfilling department major requirements.

Students considering graduate work in ps ychology should be especially well prepared in mathematics and should take experimental psychology (Psy 454). They should consider participating in research with a faculty member. They are encouraged to develop breadth by pursuing interests in diverse fields outside psychology before beginning the greater specialization of graduate work.

## PSYCHOLOGY MINOR

## REQUIREMENTS

To earn a minor in psychology a student must complete 28 credits ( 8 credits of which must be taken in residence at PSU), to include the following:

## Courses

Psy 200
Psychology as a Natural Science
4
Psy 204
Psychology as a Social Science
4
300- or 400-level psychology 20
courses (excluding 401 to 409)
Subtotal: 28
All courses submitted to satisfy the requirements for a minor in psychology must be passed with a grade of C-or above. Courses taken under the undifferentiated grading option (pass/no pass) will not be accepted toward fulfilling department minor requirements.

## PSYCHOLOGY SECONDARY EDUCATION PROGRAM

Advisor: A.Mashburn
(See Interdisciplinary Studies: Social Science (p. 288))

## Graduate programs

The Department of Psychology offers work leading to the degrees of Master of Arts and Master of Science. The departmentalso offers a Ph.D. in Applied Ps ychology.
Graduate training in psychology at Portland State University provides a sound basis in traditional areas of psychology, while emphasizing applications of psychological theory and research to problems of contemporary society.
The programfocus is on applied psychology with an emphas is on five areas: Applied Developmental, Industrial Organizational, Applied Social, Community, and Applied Quantitative Psychology. The aimis to prepare graduates for research and service roles in a variety of settings such as government agencies, businesses, educational systems, and hospitals. It should be noted that the graduate program in psychology does not offer graduate degrees in clinical or counseling psychology.

## ADMISSIONS REQUIREMENTS

Applications may be made to either the doctoral(Ph.D. in Applied Ps ychology) or the terminal master's degree (M.A. or M.S. in Psychology) programs. Those admitted to the master's programmay later apply for admiss ion to the doctoral program, conditional upon demonstrated competence at themaster's level. Applicants to either programare expected to have had preparation in experimental psychology and methods of datacollection and analysis, in addition to content areas in psychology. Admis sions granted to applicants who do not meet these requirements may be conditional upon completing preparatory coursework.

Applicants should provide the following documents: Graduate Record Examination scores (i.e., GRE scores for verbal, quantitative, and analytic abilities), if required by the area to which the applicant is applying; three letters of recommendation fromindividuals knowledgeable about the applicant's abilities (preferably fromfaculty members at colleges or universities attended); transcripts; and a 500to 1000 -word statement of academic and personal goals, which specifically addresses experiences with scientific writing, research methods, and statistics. The psychology subject test of the GRE is not required. Completed applications should be received by December 15 for admission thefollowing academic year.

## PSYCHOLOGY M.A./M.S.

Candidates for the master's degree mustearn a minimum of 54 credits, including thesis, in approved graduate courses, forty of which must be earned in psychology. Proficiency in a foreign language is required for the Master of Arts degree, but not for the Master of Science degree.

Students' individual programs are determined in consultation with their advisors.

## REQUIREMENTS

The required coursework for the master's program is as follows:

| Courses |  |  |
| ---: | :--- | ---: |
| Psy 521 | Univariate Quantitative Methods | 5 |
| Psy 522 | Multiple Regres sion and <br> Multivariate Quantitative | 5 |
|  | Methods <br> Psy 514 | Advanced Applied Social <br> Psy 515 |
| Psychology | 4 |  |
| Advanced Applied |  |  |
| Psy 516 | DevelopmentalPsychology <br> Advanced Organizational | 4 |
|  | Psychology | 4 |
| Psy 503 | Electives <br> Thesis | 24 |
|  | Pher |  |

Thesis
The student must submit and defend the thesis at an oral examination.
Subtotal: 54

## APPLIED PSYCHOLOGY PH.D.

Candidates for the Ph .D. in applied psychology musteam a minimum of 108 credits in approved graduate courses. Candidates will undertake a programof study determined in consultation with an advis ory committee. The doctoral programis equivalent to the two-year master's program described above plus additional required courses in research design, methodology, and ethics.

## REQUIREMENTS

The required coursework for the Ph .D. program, including the equivalent to the two-year master's program, is as follows:

| Courses |  |  |
| ---: | :--- | ---: |
| Psy 621 | Univariate Quantitative Methods | 5 |
| Psy 622 | Multiple Regres sion and <br> Multivariate Quantitative | 5 |
| Psy 624 | Methods <br> Research Design in Applied <br> Psychology | 4 |
| Psy 6xx | Required methodology elective <br> Psy 614 | Advanced Applied Social <br> Psychology |
| Psy 615 | Advanced Applied <br> DevelopmentalPsychology | 4 |
| Psy 616 | Advanced Organizational <br> Psy 618 | Psychology <br> Ethics and Professional Is sues in <br> Applied Research and Practice |
|  | Ad | 4 |


| 6XX | Electives in Community Psychology | 12 |
| :---: | :---: | :---: |
| 6XX | or <br> Electives in Applied Social Psychology | 12 |
| 6XX | or <br> Electives in Developmental <br> Psychology <br> or | 12 |
| 6XX | Electives in <br> Industrial/Organizational Psychology | 12 |
| 6XX | or <br> Electives in Applied Quantitative Psychology | 12 |
| 6XX | AdditionalElectives | 27 |
| Psy 503 | Thes is | 8 |
| Psy 603 | Dis sertation | 27 |

Psy 621, Psy 622, Psy 624: passing grade of $\mathrm{B}+$ or higher required
Subtotal: 108
Comprehensive examination: The comprehensive exam is comprised of exams in the major area and the minor area.

## Dissertation: The student must submit and defend the dissertation at an oral examination.

The details of all requirements are outlined in the Graduate Student Handbook which can be found on the graduate page of the department website at www.pdx.edu/psy.

## Sociology

217 Cramer Hall (CH)
503-725-3926
www.pdx.edu/sociology/

- B.A., B.S.
- Minor
- M.A., M.S.
- Ph.D.
- Ph.D.-Participating department in Urban Studies DoctoralProgram


## Undergraduate programs

Sociology is the study of society and human interaction. Sociologists examine groups of as small as two or as large as billions. From the smallest friendship or family group to the great global web of human activity, sociologists analyze and interpret our world.

Sociologists use many theoretical approaches, data, and research techniques. Information comes frommany sources including surveys, historical documents, census data, intensive interviews, and participantobservation. This information is analyzed and used to explain phenomena such as power relations, beliefs and value systems, org anizations, and the larger structure of society.

Sociology provides valuable tools for thought and a strong foundation for careers in many fields including education, business, journalism, government, and social service. A major in sociology also prepares students for graduate programs leading to careers in research, public service, and highereducation. Sociological knowledgehelps create informed and thoughtful citizens.

## DEGREE MAPS AND LEARNING OUTCOMES

To view the degree maps and expected learning outcomes for Sociology's undergraduate degrees, go to
www.pdx.edu/academic-programs/a-z.

## ADMISSION REQUIREMENTS

Admis sion to the department is based on general admis sion to the University. See Admissions Requirements (p. 8) for more information.

## SOCIOLOGY B.A./B.S.

## REQUIREMENTS

In addition to meeting the general University degree requirements, the sociology major is required to take a minimum of 49 credits in sociology courses (including 28 credits in electives in the field) and the mathematics course in statistical methods or the sociology course in social statistics.

| Courses |  |  |
| :---: | :---: | :---: |
| Soc 200 | Introductionto Sociology | 4 |
| Soc 301 | ClassicalSociological Theory | 4 |
| Soc 302 | Contemporary Sociological Theory | 4 |
| Soc 397 | Social Research Methods | 5 |
| Soc 398 | Sociology Research Project Sociology electives, including at least 12 credits in 400 -level courses | 4 28 |
| Stat 243 | Introduction to Probability and Statistics I | 4 |
| Soc 396 | or Social Research Methods, Social Statistics | 4 |

Note: Soc 396 fulfills the Stat 243 requirement for Sociology majors ONLY.

Up to 10 credits of electives taken under the undifferentiated grading option (pass/no pass) in 200- or 300-level sociology courses can be applied toward fulfilling departmental major requirements. Differentiated grades of Cor above are required for all other sociology courses and for Stat 243 or Soc 396. A student must pass Soc 301 and Soc 302 with a grade of C orbetter before taking other required courses as a sociology major.
Subtotal: 53

## SOCIOLOGY MINOR

To earn a minor in sociology a student must complete 28 credits ( 16 credits of which must be taken in residence at PSU, and 16 credits of which must be upper-division), to include the following:

## REQUIREMENTS

## Courses

Soc 200 Introduction to Sociology 4 Upper-division sociology credits 24 inclusive

Upper-division sociology credits: 12 credits of which must be at the 400-level.

Up to 10 credits taken under the undifferentiated grading option (pass/no pass) can be applied toward fulfilling departmental minor requirements.
Subtotal: 28

## SOCIOLOGY B + M ACCELERATED BACHELORS PLUS MASTERS PROGRAM

Students currently enrolled in the BA or BS in Sociology programmay be admitted directly into the MA/MS in Sociology programand share up to 20 credits of graduate level credit with the BA/BS and MA/MS in Sociology. Students can potentially complete both degrees in 4+1 years.

Students can apply for the Bachelors plus Masters in their junior year to be eligible to take 500-level courses in their senior year. The Bachelors plus Masters programshould begin in fall of their final year as an undergraduate with enrollment in SOC 590. For more information on applications or the Bachelors plus Masters program, email asksoc@pdx.edu.

SOCIOLOGY SECONDARY EDUCATION PROGRAM
(See Interdisciplinary Studies: Social Science (p. 288)).

## Graduate programs

The department of Sociology offers coursework leading to the degrees of Master of Arts (M.A.) and Master of Science (M.S.), as well as the Doctor of Philosophy (Ph.D). Students with a Bachelor's degree may enter our Master's degree program, which offers training in both quantitative and qualitative research methods. The candidate pursuing a terminalM.A./M.S. degree must complete a minimum of 45 graduate credits, including 25 credits in core sociology courses and 20 credits of electives ( 8 of which may be in departments other than Sociology).

Students with a Bachelor's degree can also choose to enter the graduate programto earn a Ph.D. in Sociology. The candidate pursuing a Ph.D must first complete their Master's degree, which includes a thesis project for doctoral-degree seeking students. Students pursuing a Master's degreeon the way to a $\mathrm{Ph} . \mathrm{D}$ must complete a minimum of 54 graduate credits, including 22 credits in core Sociology courses, 24 credits of electives ( 12 of which may be in departments other than Sociology), and 8 credits of thesis. The student must pass an oral defense of their Master's thesis. Once they have earned their Master's degree they can, with approval, continue on after receiving a Master's degree to complete a Ph.D. degree.

Students with Master's degrees from other programs and/or universities can apply to enter the graduate program at the Ph.D. level.

Graduate training in Sociology prioritizes community engagement and policy-relevantresearch focused on improving people's daily lives and society more broadly. Students focus on the integration of theory with a variety of quantitative and qualitative methodological approaches to study the dynamics of human behavior and social interaction in five substantive areas including health and medicine; environmental sociology, sociology of education; sociology of gender; and law, criminology, and deviance. The programaims to prepare graduates for research and service positions in government, the nonprofit sector, private industry, and the academy.
(p. 419)

## ADMISSIONS REQUIREMENTS

Students must be admitted to the master's and Ph.D. programs by the department and by the University. Admission ordinarily is granted only to those students beginning the programin the Fall term. Students are expected to move through the core courses as a cohort and work together with the faculty in a teamenvironment.

In addition to the general University admis sion requirements for advanced degrees, the applic ant for a sociology master's orPh.D. degree programmust have the following materials to submit as part of a complete application:

- Sociology online application.
- Three letters of recommendation frompers ons familiar with the applicant's academic performance.
- Unofficial transcripts fromall post-secondary institutions attended forevaluation purposes. Official transcripts will be requested once admitted.
- A letter of application describing their sociological interests.
- A writing sample.
- A resume, or Curriculum Vita.

Applicants for the graduate degree are normally expected to have a bachelor's degree in Sociology. Students with other underg raduate majors may be accepted; however, they must have completed courses in sociological theory, research methods, and statistics, or their equivalents.

## DEGREE REQUIREMENTS

See Univers ity master's degree requirements (p. 52). Specific departmental requirements are listed below.

## SOCIOLOGY M.A./M.S.

Students working for the Master of Arts degree must satisfy the language requirement.

## REQUIREMENTS FOR M.A./M.S. WITH THESIS

## Core ( 22 credits)

Soc $590 \quad$ SocialResearch Strategies 4
Soc 591 Theoretical Perspectives in 4
Soc 592 Qualitative Methods 4
Soc $593 \quad$ Quantitative Methods 4
Soc 507/607 Proseminar 1
Soc 507: (Course must be taken sixtimes)
Thesis (8 credits)
Soc 503 Thesis
Soc 503: (completed over three terms)
Electives ( $\mathbf{2 4}$ credits)
Soc
Three graduate-level sociology
courses
Sociology or other department
Elective courses outside sociology must be approved by the student's adviser

REQUIREMENTS FOR NON-THESIS M.A/M.S.
Electives ( 20 credits)
500/600 level electives
( 8 credits mustbe in Sociology courses.)

## Core ( 25 credits)

Soc 590 Social Research Strategies 4
Soc 591 Theoretical Perspectives in
Soc 592 Qualitative Methods
Soc 593 Quantitative Methods
Soc 537 Qualitative Data Analysis
Soc 595 Advanced Quantitative Methods
Soc 507 Professionalization Seminar

## SOCIOLOGY PH.D.

Candidates for the Ph.D. in Sociology mustearn a minimum of 54 hours in graduate coursework including 15 credits in core sociology courses, 12 elective credits ( 8 may be taken in other departments), and 27 dis sertation credits.

## REQUIREMENTS

## Core

Soc 607 Professional Seminar 3
Soc 695 Advanced Quantitative Methods 4
Soc 637 Qualitative Data Analysis 4

## Sociology Elective in Inequality

| One 600-level | Sociology elective in inequality (4 credits) |  |
| :--- | :--- | ---: |
| Soc 628 | Gender Inequality | 4 |
| Soc 665 | Environmental Sociology | 4 |
| Soc 684 | Social Inequality | 4 |
| Soc 685 | MedicalSociology | 4 |
| Soc 686 | Topics in Health and Inequality | 4 |
| Soc 687 | International Health Inequalities | 4 |
| Soc 688 | Social Sustainability Theory and | 4 |
|  | Practice |  |
| Soc 698 | Globalization Seminar | 4 |

Subtotal: 15
An alternative sociology elective in inequality may be counted with approval of the department.

## Electives

Four additional 500 or 600 level elective courses (at least 4 credits must be in sociology courses)

Subtotal: 12

## Dissertation

(includes proposal, research project and comprehensive exam)
Soc 603 Dissertation 27
Subtotal: 27
All candidates for the Ph.D. in Sociology must complete a minimum of 81 credits beyond the bachelor's degree. Subtotal: 54

## Speech and Hearing Sciences

430 Univers ity Center Building (UCB) 503-725-3533
www.pdx.edu/speech-hearing-sciences

- B.A., B.S.
- M.A.,M.S.
- UndergraduateCertificate

The Department of Speech and Hearing Sciences offers courses and clinical experiences designed to meet the needs of individuals pursuing careers in speech-language pathology, audiology, and the speech, language, and hearing sciences, and related career paths. Advanced degree holders in these fields provide services across a variety of settings to people with communication challenges and/or differences. The department offers an undergraduate and master's degree programin Speech and Hearing Sciences, as well as a Communication Sciences and Disorders certificate with baccalaureate. The master's degree programis accredited by the Council on Academic Accreditation of the American Speech-Language-Hearing Association (ASHA).

## Undergraduate programs

Undergraduates in the Speech and Hearing Sciences Department explore human communication, which includes development, diversity, and complexity of communication, as well as developmental and acquired disorders. The programleads to a B.S. or B.A. in Speech and Hearing Sciences, or a certificate with baccalaureate in Communications Sciences and Dis orders (CSD).

The cours ework explores foundational knowledge in speech and hearing sciences, clinically -based knowledge related to communication, cognition, $s$ wallowing and hearing dis orders, and the complexity and diversity of human communication. In addition to providing a rigorous liberal arts education, this degree provides a foundation for many career paths, including graduate work in speechlanguage pathology, audiology, and/or speech, language, and hearing research. Because communication is central to most human activities, a degree in Speech and Hearing Sciences can also lead to a career in many other fields, including Education, Counseling, Psychology, Social Work, and Community Relations. Coursework or a degree in Speech and Hearing Sciences complements degrees in other programs, such as education, linguistics, psychology, public health adminis tration, social work, music, and allied health professions. The CSD Certificate provides a strong educational foundation for entry into graduate programs in Speech-Language Pathology and Audiology, fulfills all but one requirement for entry into PSU's graduate programin SPHR, and provides the required educational component for licensing of Speech-Language Pathology Assistants in Oregon and other states. (Please note: the Speech-

Language Pathology Assistant license also requires clinical clock hours that are not part of the CSD Certificate program.)

## DEGREE MAPS AND LEARNING OUTCOMES

To view the degree maps and expected learning outcomes for Speech and Hearing Sciences' undergraduate degrees, go
to https://www.pdx.edu/academics/programs/u ndergraduat e/speech-and-hearing-sciences.

## ADMISSION REQUIREMENTS

Admission to the department is based on general admis sion to the University. See Admissions Requirements (p. 8) for more information.

## SPEECH AND HEARING SCIENCES B.S./B.A.

## REQUIREMENTS

In addition to meeting the general University degree requirements, the speech and hearing sciences major must meet the minimum departmental requirements as follows: all Core Courses, 8 credits of SpHr electives, and 4 credits of Stat 244, Soc 396, or equivalent course covering basic statistical reasoning for the social sciences.
In addition, students are strongly encouraged to gain proficiency in a second language. Students planning to pursuegraduate study should complete one or more courses in each of the following areas: statistics (a stand alone statistics course), biological science, physical sciences (Physics or Chemistry), and social/ behavioral sciences (see current ASHA Certification Standards). A grade of C - or above is required for all major requirements.
Foundational Core Courses ( $\mathbf{2 8}$ credits)

| SpHr 222 | Introduction to Speech, | 4 |
| :---: | :---: | :---: |
|  | Language \& Hearing Sciences |  |
| SpHr 370 | Phonetics and Acoustics | 4 |
| SpHr 371 | Anatomy and Physiology of Speech and Swallowing | 4 |
| SpHr 372U | Speech and Language | 4 |
|  | Development in Children |  |
| SpHr 461 | Neurology of Speech and | 4 |
|  | Hearing |  |
| SpHr 487 | Hearing Sciences | 4 |
| SpHr 465 | Introduction to Research | 4 |
|  | Methods for Clinical Scientists |  |
| Clinical Core Courses ( $\mathbf{2 5}$ credits) |  |  |
| SpHr 394 | Guided Observation | 1 |
| SpHr 463 | LanguageDisorders in Children | 4 |
| SpHr 464 | Speech Disorders in Children | 4 |
| SpHr 488 | Clinical Audiology | 4 |
| SpHr 489 | Aural Rehabilitation | 4 |


| SpHr 495 | Neurogenic Communication Disorders | 4 |
| :---: | :---: | :---: |
| SpHr 496 | Introduction to Clinical Management | 4 |
| Elective Courses (choose 8 credits) |  |  |
| SpHr 385 | AutismSpectrumDisorders | 4 |
| SpHr 471 | Neurolinguistics | 4 |
| SpHr 473 | Perspectives on Dis ability | 4 |
| SpHr 480 | Introduction to Sociocultural Aspects of Interactions | 4 |
| SpHr 485 | Bilingualis $m$ and | 4 |
| SpHr 491 | Communication Disorders <br> Principles of Behavior Analysis: <br> Clinical Applications | 4 |
| SpHr 410 | Selected Topics | 0-12 |

## COMMUNICATION SCIENCES \& DISORDERS UNDERGRADUATE CERTIFICATE

A candidate for a certificate must satisfy all University requirements for a baccalaureate degree with an academic major in any field. A CSD Certificate may be pursued as a post-baccalaureate program. A student pursuing a certificate in CSD must complete 49 credits, distributed as follows:

FOUNDATIONAL CORE COURSES

| SpHr 370 | Phonetics and Acoustics | 4 |
| :--- | :--- | :--- |
| SpHr 371 | Anatomy and Physiology of <br> Speech and Swallowing <br> Speech and Language | 4 |
| SpHr 372 U | Development in Children <br> SpHr 461 | Neurology of Speech and <br> Hearing |
| SpHr 487 | Hearing Sciences | 4 |

Subtotal: 20

## CLINICAL CORE COURSES

| SpHr 394 | Guided Observation | 1 |
| :--- | :--- | ---: |
| SpHr 463 | LanguageDisorders in Children | 4 |
| SpHr 464 | Speech Disorders in Children | 4 |
| SpHr 488 | Clinical Audiology | 4 |
| SpHr 489 | Aural Rehabilitation | 4 |
| SpHr 495 | Neurogenic Communication | 4 |
|  | Disorders |  |
| SpHr 496 | Introductionto Clinical | 4 |
|  | Management |  |

Subtotal: 25

## ELECTIVE COURSE (CHOOSE 4 CREDITS)

In addition to taking the above required courses, certificate students are required to take one course that explores
diverse human experiences. To fulfill this requirement students can choose to take any 300 - or 400 -level class in the following subjects: Black Studies; Chicano/Latino Studies; Indigenous Nations Studies; and Women, Gender, and Sexuality Studies, or any of the following classes:

| SpHr 473 | Perspectives on Dis ability | 4 |
| :---: | :---: | :---: |
| SpHr 480 | Introduction to Sociocultural | 4 |
|  | Aspects of Interactions |  |
| SpHr 485 | Bilingualis m and | 4 |
|  | Communication Dis orders |  |
| SpHr 410 | Selected advisor-approved | 4 |
|  | course that explores diverse |  |
|  | human experiences |  |
| Anth 318U | Asian American Experience | 4 |
| Anth 426 | Transnationalismand Migration | 4 |
| Anth 432 | Gender, Sex, and Sexuality in | 4 |
|  | Anthropological Perspective |  |
| Comm | Communication and Gender | 4 |
| 337U |  |  |
| Comm 415 | Problems of Intercultural | 4 |
|  | Communication |  |
| CR 312 | Intercultural Conflict Resolution | 4 |
| Psy 310U | Psychology of Women | 4 |
| Psy 431U | Psychology of Men and | 4 |
|  | Masculinities |  |
| Psy 458 | Development \& Education of | 4 |
|  | African-Diaspora Children \& |  |
|  | Youth |  |
| Psy 463 | Development and Education of | 4 |
|  | Immigrant Children and Youth |  |
| Soc 337U | Prejudice, Privilege, and Power | 4 |
| Soc 344U | Gender and Sexualities | 4 |
| Soc 423 | Stratification | 4 |
| Soc 427 | Genderand Work | 4 |
| Soc 430 | Hate Crimes | 4 |
| Soc 444 | Race, Ethnicity, and Nationality | 4 |
| Soc 446 | Immigrants in America | 4 |
| Soc 452 | Education and Equality: | 4 |
|  | Comparing the US, Asia, Europe |  |
| Soc 463 | Global Inequalities and Health | 4 |

Subtotal: 4
The above list is not comprehensive; students can also select a course not included here with advisor approval. For course availability, please visit PSU's Course Projection Guide.

## Total CreditHours: 49

A grade of C - or above is required for all CSD Certificate requirements. Students cannot take courses for the certificate pass/fail, with the exception of SpHr 394 Guided Observation. Students preparing for graduate programs in Speech-Language Pathology or Audiology should know that a stand-alone Statistics course is a prerequisite requirement, as well as the American Speech-

Language Hearing Association(ASHA) requirements of a biological science course, a chemis try or physics course, and a social science course.

## Graduate program

The department offers a programleading to the Master of Arts or Master of Science degrees with specialization in speech-language pathology. The Council for Accreditation of Academic Programs (CAA) of the American Speech-Language-Hearing Association accredits the SPHR graduate program. Graduates of the programmeet the requirements for clinical certification of the CAA and are eligible for licensure as speech-language pathologists by the stateof Oregon.
The graduate curriculumincludes courses aimed at providing students with a strong foundation in the nature of speech, lan guage, communication, and swallowing disorders as well as the screening, assessment, and treatment of thosedis orders. A second major component of the programconsists of supervised clinical practicain which students work directly with individuals who have swallowing, cognition, and/or communication dis orders, challenges, or differences. This typeof activity enables students to apply knowledge gained in the clas sroomand acquire requisite professional skills by partnering with clients fromdifferent backgrounds and of all ages. Students obtain practical experience through departmentbased clinics and in a broad range of externship community placements, including medical and educational settings.

## ADMISSION REQUIREMENTS

In addition to the University requirements for admis sion to graduate programs (p.42), candidates for the Master's degree programin speech-language pathology must have a background of undergraduate courses in speech and hearing sciences and related disciplines. The following courses (or their equivalents) are required prerequisites:

## PREREQUISITES

Courses

| SpHr 370 | Phonetics and Acoustics | 4 |
| :---: | :---: | :---: |
| SpHr 371 | Anatomy and Physiology of Speech and Swallowing | 4 |
| SpHr 372U | Speech and Language | 4 |
|  | Development in Children |  |
| SpHr 461 | Neurology of Speech and | 4 |
|  | Hearing |  |
| SpHr 487 | Hearing Sciences | 4 |
| SpHr 488 | Clinical Audiology | 4 |
| SpHr 489 | Aural Rehabilitation | 4 |
| Stat 243 | Introduction to Probability and Statistics I | 4 |

And
Stat 244 Statistics II

These prerequisites can be met by completing a Bachelor's degree in Speech and Hearing Sciences at Portland State University or elsewhere. Individuals with Bachelor's degrees in other disciplines may complete prerequisite courses by enrolling in the Department as a postbaccalaureate student. All prerequisites must be completed within 5 years of beginning the graduate program

## STRONGLY RECOMMENDED

Note: while the following courses are not prerequisites for our graduate program, they are strongly recommended as preparation and are included in the undergraduate degree programand the CSD certification program.

## Courses

| SpHr 394 | Guided Observation | 1 |
| :--- | :--- | :--- |
| SpHr 463 | LanguageDisorders in Children | 4 |
| SpHr 464 | Speech Disorders in Children | 4 |
| SpHr 495 | Neurogenic Communication | 4 |
|  | Disorders |  |
| SpHr 496 | Introductionto Clinical | 4 |
|  | Management |  |

All students applying for admis sion to the Master's degree programshould also have successfully completed one or more courses in each of the following areas: statistics (a stand alone Statistics course), biological science, physical sciences (Physics or Chemistry), and social/behavioral sciences. Students should also have completed 25 hours of guided clinical observation (see current ASHA Certification Standards).

Students may apply for admission to themaster's degree programwhile in the process of completing their Bachelor's degree or post-baccalaureate coursework. Completion of the prerequisitecourses does not guarantee admission into the program.

## Application procedure

Candidates applying for admission to the graduate program in Speech and Hearing Sciences must submit application packets to both theDepartment and the PSU Graduate Admis sions Office. Specific requirements of the Department include:

1. Three letters of reference completed by individuals closely acquainted with the applicant's academic or employment background. Werecommend at least two letters address academic abilities and potential to succeed in the graduate program.
2. Official transcripts fromall colleges and universities attended.
3. Personal Statement

Detailed information regarding the application process can be obtained from the Web site: www.pdx.edu/speech-hearing-sciences.

## SPEECH AND HEARING SCIENCES M.A./M.S.

See Univers ity Master's degree requirements (p. 52). Specific departmental requirements are as follows:

## REQUIREMENTS

1. Students must demonstrate the knowledge and skills required for the Certificate of Clinical Competence (CCC) from the Council for Clinical Certification (CFCC) of the American Speech-Language-Hearing Association.
2. Students must complete a minimum of 77 graduate credits : 50 credits of core coursework, 6 credits of at least 3 elective courses, 18 credits of practicum, and a minimum of 3 credits of a culminating experience.
3. Coursework. Students must complete 14 required core courses and three elective courses. A grade of B- or above must be obtained foreach course.
CORE Courses ( 50 credits):

| SpHr 530 | Evidence-based Practices in <br> Communication Disorders <br> Multicultural Topics in <br> Communication Disorders | 4 |
| :--- | :--- | :--- |
| SpHr 540 541 | Bilingual Topics in <br> Communication Disorders <br> Pathways to Professional | 2 |
| SpHr 545 | Practice | 2 |
| SpHr 554 | Advanced Speech Sound <br> Disorders:Theories and <br> Application | 4 |
| SpHr 555 | Assessmentand Treatment of | 2 |
| SpHr 556 | Dysphagia in Adults <br> Assessment and Treatment of <br> Dysphagia in Pediatrics | 2 |

SpHr $558 \quad$ SymbolSystems in Early Communication
or
SpHr 559 Augmentative and Alternative Communication

SpHr 560 Research Methods in Communication Sciences and Disorders
SpHr $562 \quad$ Cognitive Rehabilitation 4
SpHr 563 Adult Language Dis orders 4
SpHr 566 MotorSpeech Dis orders 4
SpHr 581 Stuttering 3
SpHr 582 Voice Disorders 3

| SpHr 584 | Assessment and Treatment of LanguageDisorders: Birth to Age Five |
| :---: | :---: |
| SpHr 585 | Assessment and Treatment of Language Disorders in Schoolaged Children and Adolescents |
| ELECTIVE | Courses (choose three; 6 credits): |
| SpHr 546 | Professional Ethics |
| SpHr 553 | Counseling in Communication Disorders |
| SpHr 564 | MedicalSpeech-Language Pathology I |
| SpHr 567 | Cleft and Craniofacial Dis orders |
| SpHr 568 | MedicalSpeechPathology II |
| SpHr 586 | Autism |
| SpHr 587 | Advanced Topics in Literacy in Children with Language |
|  | Impairments |
| SpHr 588 | Advanced Assessment and Intervention for Bilinguals |

Additional electives may be offered as SpHr 510 courses.
4. Clinical Practicum. Students must complete a minimum of 400 clock hours of supervised clinical experience in the practice of speech-language pathology to be eligible for profes sional certification. These include 25 hours of guided observation. In order to receive credit for clinical hours completed in a clinical practicum experience, the student must obtain a grade of B - or above in the course. Students will have the opportunity to satis fy this requirementby completing 18 required credits of SpHr 509 Practicum, which shall include PSU clinic experiences and two externships.
5. Culminating Experience. Students must complete one of the culminating experiences listed below. The decision as to which of theseoptions to pursue is to be made in conjunction with the student's academic adviser.
a. Comprehensive Examination-Thestudent must pass written comprehensive examinations. These are normally taken in the termpreceding graduation, in the student's second year of graduate study. Specific details of the adminis tration and scoring of the exams will follow current departmental guidelines. Students will register for 3 credits of SpHr 501 Research: Comprehensive Examination during the termin which they write the examination. This is the only graduate course offered on a Pas s/No Pass basis.
b. Master's Project-The student will complete a scholarly project related to his or her academic discipline under the mentorship of a faculty member. The student will comply with current departmental guidelines on the selection of the topic and format of the project. The project will be completed under the direction of a faculty
member in the department of Speech and Hearing Sciences. Students pursuing this option are required to regis ter for 3 credits of SpHr 506 Special Project with their project director. A letter grade of B - or above is required.
c. Master's Thesis-Students opting to complete a thes is under the mentorship of a faculty member will follow the University guidelines for theses outlined in Thesis (p. 54). In addition to the written thesis, the student must pass a final oral examination before a committee consisting of at least three faculty members. The chair of the committee and at least oneother faculty member must be from the department of Speech and Hearing Sciences. Students pursuing this option are required to register for a minimum of 6 credits of SpHr 503 Thes is. A letter grade of B-or above is required.

## Systems Science Program

HarderHouse
1604 SW 10th Avenue
503-725-2070
www.pdx.edu/systems-science

## SYSTEMS SCIENCE M.S.

## Master of Science in Systems Science

Students choose a combination of systems science courses plus approved courses in associated disciplines. Topics and subject areas are the same as those for the PhD program (see below). Students learn a wide variety of systems ideas, use themfor modeling and analysis in conjunction with ideas and methods fromother disciplines, and gain expertise in problem solving and integrative thinking.

## ADMISSION REQUIREMENTS

Students applying to the Masters programmust submit the following for evaluation by the Systems Science Admis sions Committee:

1. A completed Application to GraduateProgramform,
2. Official or unofficial copies of academic transcripts from all colleges and universities attended,
3. Two letters of recommendation,
4. The student's personal statement, explaining the applicant's goals for the program, and
5. If applicant would be a foreign student, TOEFL score (or other suitable evidence of English competency).

## DEGREE REQUIREMENTS

General requirements for master's degrees can be found at http://pdx.smartcatalogiq.com/en/2014-
2015/Bulletin/Graduate-Studies/Degree-requirements/Master-s-Degree. A mong the 45 hours required, 24 credits mustcome fromletter-graded courses (pass/no pass are not applicable) listed under Systems Science in the PSU Bulletin numbered SySc 510-599 or SySc 610-699. The remaining 21 credits can be satisfied through one of three options:

1. Thesis Option: An additional 12 credits that can be letter-graded Systems Science courses (numbered as above), approved courses fromother departments (see http://www.pdx.edu/sysc/approved-courses-ms-sysc), up to 3 credits of SySc 507 (Seminar) with a pass grade, and/or up to 4 Systems Science by-arrangement credits. The student must als o complete 9 thesis credits and write a master's thesis. A student selecting the thesis option must form a thesis committee of at least three faculty members, including a core faculty member from Systems Science.
2. Examination Option: An additional 21 credits that can be Systems Science courses (numbered as above), up to 3 credits of SySc 507 (Seminar) with a pass grade, approved courses fromother departments (see
http://www.pdx.edu/sysc/approved-courses-ms-sysc), and/orup to 4 Systems Science by-arrangement credits. A studentselecting the examination option will be required to pass two written comprehensive exams, each of which covers a minimum of 16 credit hours of coursework.
3. Cours ework-Only Option: An additional 8 lettergraded Systems Science courses (numbered as above), plus 13 credits of courses that may be either Systems Science courses (numbered as above), approved courses fromother departments (seehttp://www.pdx.edu/sysc/approved-courses-ms-sysc), up to 3 credits of SySc 507 (Seminar) with a pass grade, and/or up to 4 credits of Systems Science by-arrangement credits.

More detailed information is available in the Systems Science Graduate StudentHandbook at http://www.pdx.edu/sysc.

SYSTEMS SCIENCE PH.D.

## Doctor of Philos ophy in Systems Science

The doctoral programemphasizes systems ideas and methods, more specifically systems thinking, system structure and dy namics, data modeling, computer simulation, networks, complexadaptive systems, and decision analysis. Subject are as include environmental systems, sustainability, energy, health policy, biomedicine, and other areas wheres ystems ideas or methods make unique contributions to knowledge.

## ADMISSION REQUIREMENTS

To apply to the doctoral program, applicants must submit the following to forevaluation by the Systems Science Admis sions Committee:

1. A completed Application to GraduateProgramform,
2. Academic transcripts fromeach institution attended,
3. GRE scores,
4. Three letters of recommendation,
5. Pers onal statementexplaining student's interests and goals, and
6. TOEFL score or other evidence of Eng lish competency if attending as foreign student.

## DEGREE REQUIREMENTS

General requirements for doctoral degrees can be found at the Graduate School (p. 51). Additionally, Systems Science requires that students complete 84 graduate credit hours, which can include up to 28 hours of graduate credits completed at other institutions. 48 credits must be completed prior to comprehensiveexams; 9 additional credits are required prior to advancement to candidacy, and 27 dis sertation credits are required prior to graduation. Students must take SySc 511 (Systems Theory) and SySc 513 (Problem Solving) as letter-graded courses, and must take 3 credits of SySc 507 (Seminar). The remaining 46 hours are completed via one of two options:

1. Core option. Students must complete an additional 24 credits of letter-graded Systems Science labeled courses. The remaining 22 credits might be systems science labeled courses, by-arrangement credits, or courses from an outside discipline. The student's three comprehensive exams will cover 48 credit hours, including two SySc exam areas of at least 16 credits each, and one field exam area of at least 15 credits.
2. Multidisciplinary option. Students must complete an additional 16 credits of letter-graded Systems Science labeled courses plus 15 or more credits fromeach of two outside and distinct disciplines. The student's three comprehensive exams will cover 48 credithours, including one SySc exam area ofat least 16 credits, and two choice exam areas with at least 15 credits each.
All doctoral students must pass all letter-graded courses with at least a B grade, and their cumulative GPA must be at least 3.25. Once a student has completed all of the coursework required for his or her comprehensive examinations, he or she forms a comprehensive examination committee with three members, including a core faculty member from Systems Science.
Comprehensive Examinations. Within two to three years after admis sion (five years maximum), doctoral students must pass their comprehensive exams consisting of three
written exams and an oral examby his or her comprehensive examcommittee. For core option students, two exams will cover SYSC areas and one will cover a field area of the student's choice. For multidisciplinary option students, one exam will cover SYSC areas and two exams will cover field areas representing two distinct and different disciplines of the student's choice.
Advancement to Candidacy. Afterpassing comprehensive exams, the student prepares a prospectus for dis sertation research and recruits dissertation committee members under his or heradviser's supervision. An application is sent to the Graduate School, who will officially appoint the committee. Once appointed, the chair of the committee becomes the student's adviser. The student then prepares a proposal for independent research that will result in a significant and original contribution to knowledge in the systems field. When the proposal is approved by the committee and the 57 credit hour requirement (including transfercredits) and allother conditions have been met (including IRB approval if human subjects are involved), the student is advanced to candidacy. PSU requires students to be advanced to candidacy within 3 years of completing their comprehensive examinations.
Dissertation. Once the doctoral student has been advanced to candidacy, he or she completes the proposed dis sertation work. Prior to their dissertation defense, doctoral students present their research at the Systems ScienceSeminar.
The candidate's final defense of his or her completed dissertation is a presentation open to the public. It must be completed by theend of the $6^{\text {th }}$ week of a term, and no later than 5 years after the student's advancement and no later than 12 years after the student's admission. Typically, the dis sertation is completed in one or two years after the proposal is approved. The formaldefense is often preceded by a pre-defense meeting two weeks earlier, where the committee may recommend the candidate do more work before attempting the final formal defense.
Prior to graduation, students mustregister for 27 credits of dis sertation research (SySc 603), 9 of which may be taken upon completion of comps; another 9 may be taken after the dis sertation committee has been requested (with form GO-16D); the rest must be taken after the dissertation proposal has been approved. The studentcan anticipate approximately four to six years of full-time study beyond the baccalaureate degree in order to satisfy the program requirements. More detailed information is available in the Systems Science Graduate Student Handbook at http://www.pdx.edu/sysc.

## SYSTEM SCIENCE GRADUATE CERTIFICATES

The Systems Science programoffers graduate certificates in two specialty areas: Computational Intelligence and

Computer Modeling \& Simulation. Students should apply to the Graduate Certificate Programbefore they finish all of the coursework for the graduate certificate, because they must be currently enrolled in order to validate their admission to the graduate certificate programs, and they must be currently enrolled in order to be awarded the Graduate Certificate. All courses applied to the Graduate Certificate must be no more than 7 years old at the time of the awarding of the Graduate Certificate. Students should notify the Systems Science office when they are finishing their last course for the Graduate Certificate and run a DARS audit to ensure all requirements have been met.
Certificate Requirements
In order to earn a graduate certificate, a student must:

- complete 15 credit hours of courses in the specialty area,
earn a GPA of 3.25 for these courses, and complete the online Application for Graduation.


## Admission requirements

Students admitted to the master's or doctoral programneed not apply separately for admis sion to a graduate certificate. But to add the certificate to their master's or doctoral programthey must submit the GO-19M or GO-19D form (see http://www.pdx.edu/ogs/forms to The Graduate School at least onetermbefore they apply for completion of the certificate.
Students notadmitted to the doctoral or master's program must submit to Systems Science: (1) a completed Application to Graduate Programform, and (2) official or unofficial copies of academic transcripts froman institution. The admis sions committee will recommend the student's admis sion if his or her academic transcript shows a completed undergraduate degree with a GPA of 2.75 or higher.

## Certificate Requirements

Graduate certificate students must earn at leasta B in all courses and their cumulative GPA must be at least 3.25. More detailed information is available in the Systems Science Graduate StudentHandbook at http://www.pdx.edu/sysc.

## COMPUTATIONAL INTELLIGENCE GRADUATE CERTIFICATE

The graduate certificate in Computational Intelligence encompasses neural networks, evolutionary computing,
fuzzy set theory, and artificial intelligence. Typical application areas include pattern recognition, data-mining, control, signal processing, and non-linear optimization.

## DEGREE REQUIREMENTS

| Required Course |  |  |
| :--- | :--- | :--- |
| SySc 575 | AI: NeuralNetworks I |  |
| Subtotal: 4 |  |  |
| Choose from the following: |  |  |
| CS 541 | Artificial Intelligence |  |
| CS 545 | Machine Learning | 3 |
| CS 546 | Advanced Topics in Machine | 3 |
|  | Learning | 3 |
| CS 570 | Machine Learning Seminar |  |
| ECE 510 | Topics:Mathematical | 1 |
|  | Foundations of Machine | 4 |
|  | Learning |  |
| SySc 551 | Discrete Multivariate Modeling | 4 |
| SySc 557 | Artificial Life | 4 |

Subtotal: 11
Subtotal: 15
Total Credit Hours: 15
COMPUTER MODELING \& SIMULATION GRADUATE CERTIFICATE

The graduate certificate in Computer Modeling \&
Simulation encompasses linear systems theory, discrete, agent-based, and continuous systemsimulation, and statistical modeling of structure. Typical application areas include process engineering, policy evaluation, data analys is \& interpretation, and the study of feedback dynamics in complexsystems.

## DEGREE REQUIREMENTS

| Required Course |  |  |
| :--- | :--- | :--- |
| SySc 514 | SystemDynamics | 4 |
|  | Subtotal: 4 |  |
| At least one of the following two courses: |  |  |
| SySc 525 | Agent Based Simulation | 4 |
| SySc 527 | Discrete SystemSimulation | 4 |

Subtotal: 4-8

## Eectives

One of the following courses if all three of the above courses are taken; otherwise two of the following courses:

| CS 545 | Machine Learning | 3 |
| :--- | :--- | :--- |
| Psy 523 | Structural Equation Modeling | 4 |
| SySc 535 | Modeling \& Simulation with R | 4 |
|  | and Python |  |
| SySc 540 | Introductionto Network Science | 4 |
| SySc 551 | Discrete Multivariate Modeling | 4 |

Subtotal: 3-8
Subtotal: 15

Total Credit Hours: 15-16

## SYSTEMS MINOR

A Minor in Systems is an ideal complement to majors in the Natural and SocialSciences, Philos ophy, Mathematics, Computer Science, Engineering, Public Administration and Business, and to anyone with an interdis ciplinary focus. Systems ideas deepen our understanding of complexity and offergeneral principles that are useful in every field. Applications include environmental, biomedical, and other social and technical problems. Systems thinking and methods of computer modeling and data analy sis empower both practitioners and academics.

## REQUIREMENTS (24 CREDITS)

## Choose six from the following list:

At least two of the sixrequired courses MUSTbe taken at the SySc 410-SySc 499 level. A maximum of 4 SySc 405 and/or SySc 409 credits can apply. All courses must be graded and passed with a B-or higher.

EAS 333U Problems, Solutions,
Systems Thinking
ESM 220 Introduction to Environmental 4
Systems
Applied Environmental Studies: 4
ProblemSolving
PhysicalGeography
$\begin{array}{lll}\text { Phl 322U } & \text { Minds and Machines } & 4 \\ \text { Phl 470 } & \text { Philosophy of Science } & 4\end{array}$
Psy 413 Ecopsychology 4
Sci 313U EnvironmentalMathematical 4
SySc 330U Models in Science 4
SySc 332U Introduction to Agent-Based 4
Modeling
SySc 334U Modeling Social-Ecological 4
Systems
Networks and Society 4
Decision Making in Complex 4
Environments: A View Towards
Collective Action and Social
Change
SySc 340U Big Data and the Modern W orld 4
SySc 342U Systems Thinking for Social 4
Change
Exploring Complexity in 4
Science and Technology
SySc 350U $\quad \begin{aligned} & \text { Indigenous and Systems } \\ & \\ & \text { Perspectives on Sustainability }\end{aligned}$
4
SySc 350U $\quad \begin{aligned} & \text { Indigenous and Systems } \\ & \\ & \text { Perspectives on Sustainability }\end{aligned}$
SpecialStudies
SySc 399

| SySc 405 | Reading and Conference | 1-8 |
| :---: | :---: | :---: |
| SySc 409 | Practicum | 1-8 |
| SySc 410 | Selected Studies | 1-6 |
| SySc 411 | Systems Theory | 4 |
| SySc 413 | Holistic Strategies for Problem Solving | 4 |
| SySc 414 | SystemDynamics | 4 |
| SySc 416 | Systems Thinking for Business | 4 |
| SySc 418 | SystemSustainability and Organizational Resilience | 4 |
| SySc 421 | Systems Philosophy | 4 |
| SySc 423 | Systems Ideas and Sustainability:Limits, Structural Change, and Resilience | 4 |
| SySc 431 | Data Mining with Information Theory | 4 |
| SySc 435 | Modeling \& Simulation with R and Python | 4 |
| SySc 440 | Introductionto Network Science | 4 |
| SySc 445 | Application of Data Science | 4 |
| SySc 452 | Game Theory | 4 |

Subtotal: 24

## Women, Gender, and Sexuality Studies

150 Parkmill Building (PKM)
1633 SW Park Ave.
503-725-3516
www.pdx.edu/women-gender-sexuality-studies/

- B.A., B.S.-Women's Studies
- B.A., B.S.-Sexuality, Gender, and Queer Studies
- Minor in Women's Studies
- Minor in Sexuality, Gender, and Queer Studies
- Postbaccalaureate Certificate in Women's Studies

In the School of Gender, Race and Nations, the Department of Women, Gender, and Sexuality Studies offers an interdisciplinary program designed to foster students' personal and intellectual development and to prepare themfor socially res ponsible citizenship as well as a broad range of careers. W omen, Gender, and Sexuality Studies advisers work closely with each student to craft a course of study appropriate to the student's academic interests and post-graduate goals.

An expanding field of scholarship, women, gender, and sexuality studies is on the cutting edge of educational and intellectual innovation. The department offers two different majors: the Women's Studies major, and the Sexuality, Gender, and Queer Studies major. The Women's Studies major encourages students to develop critical thinking skills and an appreciation for the range of theoretical frameworks and methodologies present in contemporary feminist scholarship. Courses incorporate the diversity of women's experience with attention to race, class, and
sexual orientation as well as gender. Core courses also encouragestudents' active participation through discussion, informal as well as formal writing, and collaborative learning in the clas sroom.
The major in Sexuality, Gender, and QueerStudies (SGQS) is designed to provide an in-depth study of sexual desire, sexual behavior and identity, gendered behavior, gender identity, and the sexed body as socially, culturally, and historically produced. The core curriculumemphasizes queer and trans of color theorizing and critiques including queer indigenous, Two-Spirit, and transnational perspectives; critical analy sis of the relationships between sexuality and other power formations such as gender, race, class, nation, ability, nature, citizenship, age, and size; historical contexts and contemporary connections among rigorous theoretical, activist, political, and practiceoriented approaches; and an interdisciplinary, queer, and decolonial approach to analy ses of the creative arts, humanities, and health and social sciences.

Experiential learning plays an importantrole in a student's progress through the women, gender, and sexuality studies curriculum. The program's extensive and long-established ties with organizations in the Metro area provide wideranging opportunities for students to apply their clas sroom knowledge in a community setting. Many students discover a life's vocation through these experiences, and all develop new skills. Guidelines for women, gender, and sexuality studies practica and independent study are flexible in order to meet individualneeds. Degrees in Women's Studies and Sexuality, Gender, and Queer Studies provide the foundations for life-long learning as well as background and experience forcareers in teaching, counseling and social work, business, law, health sciences, public adminis tration, public relations, and academia.

## DEGREE MAPS AND LEARNING OUTCOMES

To view the degree maps and expected learning outcomes for Women, Gender, and Sexuality Studies' undergraduate degrees, go to www.pdx.edu/academic-programs/a-z.

## ADMISSION REQUIREMENTS

Admission to the department is based on general admission to the University. See page for Admis sions Requirements (p. 8) for more information.

## WOMEN'S STUDIES B.A./B.S.

In addition to meeting the general University degree requirements, the student majoring in Women's Studies must complete a required core programof 36 credits and 20 credits of WS electives (with a minimum of 16 upper-
division credits) for a total of 56 credits to complete the major.

Each student pursuing a Women's Studies major will select or be assigned an adviser who is knowledgeable in the student's area(s) of academic interest.

Courses taken under the undifferentiated grading option (pass/no pass) are not acceptable toward fulfilling major requirements with the following exceptions: one Women, Gender, and Sexuality Studies elective course, WS 404 Cooperative Education/Internship, or WS 409 Practicum. The minimum grade allowed to pass major requirements will be 1.7 C -

## REQUIREMENTS

| Core courses (28 credits) |  |  |
| :---: | :---: | :---: |
| WS 101 | Introduction to Women's Studies | 4 |
|  | or |  |
| UnSt 231 | Gender and Sexualities | 4 |
|  | or |  |
| WS 332U | Race, Class, Gender, and | 4 |
|  | Sexuality in the United States |  |
| WS 301 | Feminisms: Theories and | 4 |
|  | Analyses |  |
| WS 305 | Women of ColorFeminist | 4 |
|  | Theory |  |
| WS 307U | Resistance, Activism, and Social | 4 |
|  | Change |  |
| WS 412 | Feminist Methodologies | 4 |
| WS 415 | Senior Seminar | 4 |
| WS 471 | Global Feminis ms | 4 |
| Experiential learning (8 credits) |  |  |
| WS 409 | Practicum | 6 |
| WS 411 | Experiential Learning Seminar | 2 |
| Hectives ( $\mathbf{2 0}$ credits; with a minimum of 16 upperdivision credits) |  |  |
| WS 306U | Global Gender Issues | 4 |
| WS 308U | Topics in Gender, Literature, and Popular Culture | 4 |
| WS 310U | Psychology of Women | 4 |
| WS 312U | Feminist Philosophy | 4 |
| WS 317U | Writing as Activism | 4 |
| WS 320U | Introduction to Girls'Studies | 4 |
| WS 330U | Women of Color in the United | 4 |
|  | States |  |
| WS | Women and the Middle East | 4 |
| 331U/Intl |  |  |
| 331 U |  |  |
| WS 332U | Race, Class, Gender, and | 4 |
|  | Sexuality in the United States |  |
| WS 337U | Communication and Gender | 4 |
| WS 340U | Women and Gender in America | 4 |
|  | to 1848 |  |


| WS 341U | Women and Gender in America 1848-1920 | 4 |
| :---: | :---: | :---: |
| WS 342U | Women and Gender in the U.S. 1920 to the Present | 4 |
| WS 343U | American Family History | 4 |
| WS 344U | QueerEcologies | 4 |
| WS 346U/Bi | Genes \& Society | 4 |
| 346U |  |  |
| WS | Science, Gender, and Social | 4 |
| 347U/Sci | Context |  |
| 347U |  |  |
| WS | Science, Gender, and Social | 4 |
| 348U/Sci | Context |  |
| 348U |  |  |
| WS 351U | Gender and Education | 4 |
| WS 360U | Introduction to Queer Studies | 4 |
| WS | The Science of Gendered Bodies | 4 |
| 365U/Sci |  |  |
| 365U |  |  |
| WS 367U | War, Sexual Violence and | 4 |
| WS 369U | Global Reproductive Justice | 4 |
| WS 370U | History of Sexualities | 4 |
| WS 373/Phl | QueerPhilosophy | 4 |
| 373 |  |  |
| WS 374U | Memoir, Gender, and Sexuality | 4 |
| WS 375U | Topics in Sexuality Studies | 4 |
| WS | Topics in Literature, Gender, and | 4 |
| 372U/Eng | Sexuality |  |
| 372U |  |  |
| WS 377U | Topics in Feminist Spirituality | 4 |
| WS | Feminist Care Ethics | 4 |
| 379U/Phl |  |  |
| 379U |  |  |
| WS 380U | Women and Politics | 4 |
| WS 387 | Feminist Organizations: Theory and Practice | 4 |
| WS 410 | Selected Topics | 1-6 |
| WS 417 | Women in the Economy | 4 |
| WS 424/PS | Women and the Law | 4 |
| 425 |  |  |
| WS 425/Soc | Sociology of Gender | 4 |
| 425 |  |  |
| WS 426/Soc | Gender \& Mental Health | 4 |
| 426 |  |  |
| WS 428 | Lesbian History | 4 |
| WS | Women in the Visual Arts | 4 |
| 431U/ArH |  |  |
| 431U |  |  |
| WS 444 | British Women Writers | 4 |
| WS 445 | American Women Writers | 4 |
| WS 451 | Interrupting Oppression | 4 |
| WS | Gender and Race in the Media | 4 |
| 452/Comm |  |  |
| 452 |  |  |


| WS 453 | Feminism and Women?s Health | 4 |
| :---: | :---: | :---: |
| WS 467 | Work and Family | 4 |
| WS 470U | Asian American Women's | 4 |
|  | Studies |  |
| WS 479 | Women and Organizational | 4 |
|  | Psychology |  |
| WS 480 | Introductionto Critical | 4 |
|  | Disability Studies |  |
| WS 481 | Dis ability and Intersectionality | 4 |
| Anth 432 | Gender, Sex, and Sexuality in Anthropological Perspective | 4 |
| BSt 342U | Black Feminism/Womanism | 4 |
| BSt 419 | African American Women in | 4 |
|  | America |  |
| ChLa 303U | Chicana/LatinaExperience | 4 |
| Intl360U | Bollywood:Communicating | 4 |
|  | Contemporary South Asia throughCinema |  |
| JSt 335U | Sex, Love, and Gender in Israel | 4 |
| NAS 344 | Indigenous Women Leadership | 4 |
| Phl 369U | Philosophy of Sex and Love | 4 |
| Subtotal:56 |  |  |
| SEXUALITY, GENDER AND QUEER STUDIES B.A./B.S. |  |  |
|  |  |  |
| In addition to meeting the general University degree requirements, the student majoring in Sexuality, Gender, and Queer Studies mustcomplete a required core program of 36 credits and 20 credits of approved WS electives (with a minimum of 16 upper-division credits) for a total of 56 credits to complete the major. |  |  |
|  |  |  |
| Each student pursuing a Sexuality, Gender, and Queer Studies major will select or be as signed an adviser who is knowledgeable in the student's area(s) of academic interest |  |  |
|  |  |  |
| REQUIREMENTS |  |  |
| The major in Sexuality, Gender and Queer Studies (SGQS) is 56 credits. Those credits are divided as follows: |  |  |
| Experiential Learning Requirements (8 credits) |  |  |
| WS 409 | Practicum | 6 |
| WS 411 | Experiential Learning Seminar | 2 |
| Core Courses (28 credits) |  |  |
| UnSt 231 | Gender \& Sexualities | 4 |
|  | or |  |
| WS 332U | Race, Class, Gender, and | 4 |
|  | Sexuality in the United States |  |
| WS 307U | Resistance, Activism, and Social | 4 |
|  | Change |  |
| WS 360U | Introduction to Queer Studies | 4 |
| WS 381 | Queer of Color Theorizing and | 4 |
|  | Perspectives |  |
| WS 412 | Feminist Methodologies | 4 |


consult with a SGQS advis or for approval.

The minimum grade allowed to pass major requirements will be 1.7 C -. The only major requirement with a P/NP grading option is WS 409.
Subtotal: 56

## WOMEN'S STUDIES MINOR

## REQUIREMENTS

A minor in Women's Studies will consistof 28 credits. Students will be required to take:

| Core Courses (12 credits) |  |  |
| :---: | :---: | :---: |
| WS 101 | Introductionto Women's Studies or | 4 |
| UnSt 231 | Gender and Sexuality Studies or | 4 |
| WS 332U | Race, Class, Gender, and Sexuality in the United States | 4 |
| As well as two of the following courses: |  |  |
| WS 301 | Feminis ms: Theories and Analyses | 4 |
| WS 305 | Women of ColorFeminist Theory | 4 |
| WS 307U | Resistance, Activism, and Social Change | 4 |
| WS 412 | Feminist Methodologies | 4 |

## Eectives ( $\mathbf{1 6}$ credits)

Elective requirements may be fulfilled by any of the following core courses or by WS electives (see WS major electives listing (p.340)), including courses cross-listed with other departments or approved by a WS adviser.
WS 409 Practicum
WS 411 Experiential Learning Seminar 2
WS 415 SeniorSeminar 4
WS 471 Global Feminis ms 4
Subtotal: 28
Courses taken under the undifferentiated grading option (pass/no pass) are not acceptable toward fulfilling minor requirements with the following exceptions: one Women, Gender, and Sexuality Studies elective course or WS 409 Practicum.

## SEXUALITY, GENDER, AND QUEER STUDIES MINOR

The minor in Sexuality, Gender, and Queer Studies is an interdisciplinary program which examines sexual desire, sexual practice, gender expression, gender identity, and the sexed body as more than products of biology, but rather as socially organized, even socially produced phenomena located within specific power formations and subject to
historical change. This programquestions commonplace knowledge, providing new frameworks for the critical study of gender and sexuality. The curriculumincludes a broad spectrumoftopics related to sexuality and gender, from queer theory and film to the ps ychology of masculinities, the history of sexualities, and global is sues in sexual health.
The minor consis ts of 32 credits, including four core courses ( 16 credits) and 16 credits of electives:

## REQUIREMENTS

Core Courses

UnSt 231 lis | Gender \& Sexualities |
| :--- |
| WS 307U |
| Resistance, Activism, and Social |
| Change |$\quad 4$

| PHE 335U | Human Sexuality |  |
| :---: | :---: | :---: |
| PHE 410 | Sex Education in America | 4 |
| PHE 410 | Worldview of Sexual Health |  |
| PHE 453 | Women's Reproductive Health |  |
| Phl 369U | Philosophy of Sex and Love |  |
| Psy 425 | Ps ychology of Black Manhood in America | 4 |
| Psy 431U | Psychology of Men and Masculinities | 4 |
| Psy 469 | Psychology of Human Sexuality |  |
| Soc 339U | Marriage and Intimacy |  |
| Soc 344U | Gender and Sexualities | 4 |
| Span 410 | Selected Topics | 1-12 |
| Span 436 | MajorTopics:Latin American Multiple Genres | 4 |
| WS 305 | Women of ColorFeminist | 4 |
| WS 308U | Theory <br> Topics in Gender, Literature, and PopularCulture |  |
| WS 370U | History of Sexualities |  |
| WS | Topics in Literature, Gender, and |  |
| $\begin{aligned} & \text { 372U/Eng } \\ & \text { 372U } \end{aligned}$ | Sexuality |  |
| $\begin{aligned} & \text { WS 373/Phl } \\ & 373 \end{aligned}$ | Queer Philosophy | 4 |
| WS 374U | Memoir, Gender, and Sexuality | 4 |
| WS 375U | Topics in Sexuality Studies |  |
| WS 381 | Queer of Color Theorizing and Perspectives | 4 |
| WS 382U | Trans gender Studies | 4 |
| WS 482 | Topics in Global Sexuality Studies | 4 |

## Subtotal: 32

Courses taken under the undifferentiated grading option (pass/no pass) are not acceptable toward fulfilling minor requirements with the exception of WS 409 Practicumif approved by a programadviser.

## WOMEN'S STUDIES POST-BACCALAUREATE CERTIFICATE

The WS post-bac certificate consists of 28 required credits plus 16 approved upper-division electives for a total of 44 credits. In meeting the 16 elective credits, students may take a maximum of 12 credits in any one academic area (arts \& letters; science; social science).

## REQUIREMENTS

| Core Courses |  |  |
| :---: | :--- | :---: |
| WS 301 | Feminisms:Theories and | 4 |
| WS 305 | Analyses |  |
|  | Women of Color Feminist <br> Theory | 4 |
| WS 412 | Feminist Methodologies | 4 |
| WS 415 | Senior Seminar | 4 |

WS 409 Practicum 6
WS 411 Experiential Learning Seminar 2
WS 471 Global Feminisms 4
Electives ( $\mathbf{1 6}$ credits; see elective listing under WS major)

> Approvedupper-division
> electives (minimum of 12 upperdivision)

## Total Credit Hours: 44

Courses taken under the undifferentiated grading option (pass/no pass) are not acceptable toward fulfilling Certificate requirements with the following exceptions: one Women, Gender, and Sexuality Studies elective course, or WS 409.

## World Languages and Literatures

315 Fariborz Maseeh Hall (FMH)
503-725-3522
world@pdx.edu
www.pdx.edu/world-languages

- B.A.-Concentration in Arabic, French, German, Japanese, Rus sian, or Spanish (Please note, applications for the concentration in Chinese are not being accepted at this time.)
- Minor-Concentration in American Sign Language, Arabic, French, German, Hebrew, Italian, Japanese, Persian, Russian, or Spanish (Pleas enote, applications for the concentration in Chinese are not being accepted at this time.)
- Minor in ClassicalStudies
- Certificate in Comparative Literary and Cultural Studies
- Certificate in Intercultural Competence for the Workplace
- Certificate in Teaching Japanese as a Foreign Language
- Certificate of Advanced Proficiency in Rus sian
- Certificate in W orld LanguagePedagogy
- Secondary Education Program
- M.A.-World Language: German, Japanese, or Spanish (Please note, the MA in French has been suspended effective fall 2020, and no applications are being accepted at this time.)
- M.A.-W orld Languages and Literatures: primary languages-German, Spanish; secondary languagesArabic, Chinese, French, German, Japanese, Russian, or Spanish (Pleasenote, the MA in French as a primary language has been suspended and no applications are
being accepted at this time. Students may still apply for the MA with French as a secondary language.)


## Foreign Language Requirements

At Portland State University, all incoming students who graduate froman Oregon high school in 1997 or later must demons trate proficiency in a second language as an admis sion requirement. And most BA or MA programs require students toachieve proficiency in a foreign language as a degree requirement. Students may satisfy the foreign language requirements by taking courses offered through the Department of World Languages and Literatures, or as an alternative, by passing a language test. Testing for language requirement equivalence is only available for languages listed on the WLLwebsite. If your language does not appear in the testing list, you must satisfy the language requirement through transcripted univers ity or community college coursework. If you have questions about any foreign language requirement, go to http://www.pdx.edu/wll/foreign-language-requirement.

## Credit for Prior Learning

Credit for Prior Learning (CPL) may be granted for firstyear and second-year language sequences only. A student may be awarded credit by taking an examthrough CPLfor a maximum of one language sequence (12-15 credits). CPL is available only for those languages taught by the department. Credit received by examination is graded P/NP only.

Students of French, German, or Spanish may receive credit for first- or second-year by taking a CLEP exam. The amount of credit awarded will depend on the score received. Students of American Sign Language, Arabic, Chinese, Danish, Modern Hebrew, Italian, Japanese, Korean, Latin, Norwegian, Persian, Portuguese, Russian, Swedish, or Vietnamese should contact the department for individual testing.

Native speakers (defined as students whose formal secondary education was completed in the foreign language) may not receive credit by examination for their native language.

## Undergraduate programs

The Department of W orld Languages and Literatures offers undergraduate major programs in Arabic, Chinese, French, German, Japanese, Russian, and Spanish; minor programs in the above languages and in American Sign Language, Italian, Persian, and ClassicalStudies; and instruction in the above languages, as well as in Modern Hebrew, Italian, Korean, Latin, Norwegian, Portuguese, Swedish, and Vietnamese. Other languages may be offered from time to time.

## DEGREE MAPS AND LEARNING OUTCOMES

To view the degree maps and expected learning outcomes for World Languages and Literatures' undergraduate degrees, go to www.pdx.edu/academic-programs/a-z.

## WORLD LANGUAGE B.A.

The Department of W orld Languages and Literatures offers undergraduate majors in Arabic, French, German, Japanese, Russian, and Spanish. (Please note, applications are not currently being accepted for the concentration in Chinese.) An undergraduate world language major must complete 32 upper-division credits (numbered 300 or higher) in language, literature and culture, an additional 8 credits in 400-level language and literature courses (excluding 401-410, except for Fr which accepts 401-410), 8 credits in adviser-ap proved electives, and 4 credits in linguistics (Ling 390, WLL 390, or a linguistics course in the target language). French majors must include a minimum of two courses from the $341,342,343,344$ sequence and a minimum of 16400 -level credits in their total program. Spanish majors mustinclude at leastone course fromthe $341,342,343,344,345$ sequence and a minimum of 16400 -level credits in their total program.

## REQUIREMENTS

## Courses

400-level courses in the major language ( 8 credits)
(excluding 401-410, except for Fr which accepts 401-410)

## Language, literature, and culture ( 32 credits)

(in Fr this must include two courses from the 341-342-343344 sequence and at least 16400 -level credits in their total program)
(in Span this must include one course from the 341-342-343-344-345 sequence and at least 16400 -level credits in their total program)

| Linguistics (4 credits) | 4 |  |
| :--- | :--- | :--- |
| WLL 390 | Languages of the World | 4 |
| Ling 390 | Introduction to Linguistics | 4 |
|  | or |  |
|  | a linguistics course in the major <br> language |  |

## Adviser-approved electives (8 credits)

Subtotal: 52

- Before being admitted to 400-level courses, students will be expected to demonstrate proficiency at a level determined by the individual language program.
- No more than 8 credits of courses numbered 404 (CooperativeEducation) may be counted toward the major.
- 20 of the required 52 credits must be taken in residence at PSU (excludes credit by exam but includes study abroad credit fromPSU approved programs).
- All courses used to satisfy major requirements mustbe passed with a grade of Cor higher. (C- and P are not acceptable.) Students majoring in a world language must maintain a minimum GPA of 2.50 on all courses used to satisfy the major requirements.


## WORLD LANGUAGE MINOR

The Department of World Languages and Literatures offers undergraduate minors in American Sign Language (ASL), Arabic, French, German, Italian, Jap anese, Modern Hebrew, Persian, Rus sian, and Spanish. (Please note, applications for the concentration in Chinese are not currently being accepted.) An undergraduate world language minor must complete 20 upper-division credits (numbered 300 or above) in language, literature, or culture, at least 12 of which are in the target language (at least 8 of which are in the target language in the Italian and Persian minors), and 4 credits in general linguistics (WLL 390, Ling 390, or a linguistics course in the target language).

## REQUIREMENTS

## Courses

| Language, literature and culture | 20 |
| :--- | ---: |
| Linguistics | 4 |

- No more than 4 credits of courses numbered 404 (Cooperative Education) may be counted toward the minor.
- Twelve of the required 24 credits must be taken in residence at PSU (includes study abroad credit from PSU approved programs).
- All courses used to satisfy the departmental minor requirements, must be graded Corhigher. (C- and $P$ are not acceptable). Students minoring in a foreign language must maintain a minimum GPA of 2.50 on all courses used to satisfy the minor requirements.


## CLASSICAL STUDIES MINOR

An undergraduate minor in classical studies consists of 24 credits of Latin (two years of Latin) and 16 credits of area classes selected from the list below.

## REQUIREMENTS

## Language: 24 credits of Latin

Two years of Latin
Area Classes ( $\mathbf{1 6}$ credits)
ArH 352U Ancient Greek Art and
Architecture
ArH 353U Ancient Roman andEtruscan
Eng 317U Greek Mythology
Grk 330U Ancient Epic: Glory and 4

Grk 332U
Grk 333U
Grk 335 U
Grk 336U
Hst 309U
Hst 310U
Hst 315U
Hst 316U
JSt
378U/Hst
378 U
Lat 330U
Lat 341 U
Phl 301U
Phl 414
Phl 415
TA 471

Gods and Mortals: Harnessing the Divine
Women in Ancient Greece

## Roman Culture

Roman Literature in Translation 4
Ancient Philosophy
Aristotle 4
TheaterHistory:Periods and 1-4

Subtotal: 40

- Twelve of the required 40 credits must be taken in residenceat PSU.
- All courses used to satisfy minor requirements mustbe graded Cor higher. Students minoring in clas sical studies must maintain a minimum GPA of 2.50 in all courses used to satisfy the minor requirements.


## COMPARATIVE LITERARY AND CULTURAL STUDIES UNDERGRADUATE CERTIFICATE

The Certificate in Comparative Literary and Cultural Studies is a multidis ciplinary programthat offers students the opportunity to study literature across linguistic and national borders as well as explore the intersections of literature with other forms of creative expression such as comics, film, the visual arts, and new media. The certificate also encourages students to contextualize literary study by investigating connections with other humanities and social science disciplines.

It is designed to fit into WLLand English major and minor programs as well as other fields, including History, Anthropology, and International Studies, and is especially suitable for students who have begun to achieve proficiency in a world language.

In addition to having completed the complete second-year cycle of their foreign language, students will take two required courses and two electives. Required courses include a core theory class on how to conduct comparative literary and cultural studies; for the second required course, students choose a topics course on either translation studies or comparative media/arts (film, literature, comic books). The two electives for the certificate consistof other Eng,

WLL, Hst, Intl, Phl, Anth options and more. Candidates may enroll as undergraduate or post-baccalaureate students. Students will have an adviser for the certificate who will guide themthrough the coursework.

Students are required to take a total of 16 credits including two required WLL/Eng Comparative Studies courses and two electives fromthe list below. Students are expected to have an intermediate language proficiency, demonstrated by completing the second-year language sequence at PSU (201-202-203) or its equivalent or one language course at the 301 level or higher.

## Prerequisites (World Language)

A complete 201-202-203 sequence in a foreign language (Arabic, French, Japanese, etc.) either as 12 or 15 credits (depending upon the language); alternatively, students with at least one foreign language course at 301 or above (minimum 4 credits ) can satis fy this requirement. Students can complete the language requirement while taking courses towards the certificate.

## CORE (8 CREDITS)

| $\begin{aligned} & \text { Eng } \\ & 380 / \mathrm{WLL} \\ & 380 \end{aligned}$ | Introduction to Comparative | 4 |
| :---: | :---: | :---: |
|  | Literary and Cultural Studies |  |
|  |  |  |
|  | and |  |
| Eng | Topics in Translation Studies | 4 |
| $\begin{aligned} & 381 / \mathrm{WLL} \\ & 381 \end{aligned}$ |  |  |
|  |  |  |
|  | or |  |
| Eng | Topics in Comparative | 4 |
| 383U/WLL | Literature, Film, and Comics |  |
| 383 U |  |  |
| ELECTIVES (8 CREDITS) |  |  |
| Two courses from the following list: |  |  |
| WLL 381/Eng 381 and/or WLL383U /Eng 383U can be chosen if not being applied to one of the two core classes. |  |  |
| Anth 300U | The Modern World in | 4 |
|  | AnthropologicalPerspective |  |
| Anth 330U | Anthropology of Folklore | 4 |
| Anth 357U | Archaeology in Popular Culture | 4 |
| Anth 435 | Visual Anthropology | 4 |
| Eng 318U | The Bible as Literature | 4 |
| Eng 325U | PostcolonialLiterature | 4 |
| Eng 330U | Jewish and Is raeli Literature | 4 |
| Eng 332U | History of Cinema and Narrative Media I | 4 |


| Eng 333U | History of Cinema and Narrative Media II | 4 |
| :---: | :---: | :---: |
| Eng | Topics in Literature and Film | 4 |
| 335U/NAS |  |  |
| 335U |  |  |
| Eng 368U | Literature and Ecology | 4 |
| Eng | Topics in Literature, Gender, and | 4 |
| 372U/W S | Sexuality |  |
| 372U |  |  |
| Eng 373U | Topics in Literature, Race, and Ethnicity | 4 |
| Eng 420 | Caribbean Literature | 4 |
| Eng 422 | African Fiction | 4 |
| Eng 449 | Advanced Topics in Cultural Studies | 4 |
| Eng 491 | History of Literary Criticism and Theory I | 4 |
| Eng 492 | History of Literary Criticism and Theory II | 4 |
| FILM 487 | Topics in International Film and the Moving Image | 4 |
| Hst 322U | Modern East Asia | 4 |
| Hst 354U | Early MedievalEurope: 3001100 | 4 |
| Hst 355U | Late MedievalEurope, 1100- $1450$ | 4 |
| Hst 356U | Renais sance and Reformation | 4 |
|  | Europe, 1400-1600 |  |
| Hst 382U | Palestine and Is rael | 4 |
| Hst 384U | Ottoman World | 4 |
| Hst 385U | Late Imperial Middle East, 17001914 | 4 |
| Hst 386U | Middle East in the Twentieth | 4 |
|  | Century |  |
| Hst 390U | China, Japan, and Korean Relations in Global Context | 4 |
| Hst 390U | Comp Social Revolutions | 4 |
| Hst 390U | Global History of W arfare | 4 |
| Hst 390U | World Religions | 4 |
| Hst 422 | Topics in Postwar Japanese | 4 |
|  | History, 1945-present |  |
| Hst 490 | Comparative World History | 4 |
| Intl | The Global City in Film | 4 |
| 314U/USP |  |  |
| 314 U |  |  |
| Intl350U | The City in Europe | 4 |
| Intl360U | Bolly wood:Communicating | 4 |
|  | Contemporary South Asia throughCinema |  |
| Intl380U | Globalization, Representation and Difference in Media and | 4 |
|  | Film |  |
| Intl391U | Media and International | 4 |
|  | Relations |  |
| NAS 351 | Indigenous Philosophy | 4 |


| Phl 319U | Introduction to Asian Philosophy | 4 |
| :--- | :--- | :--- |
| Wr 431 | Adv. Topics in Tech Writing | 4 |
|  | Technologies: Tools for |  |
|  | Translation and Localization |  |

## Total CreditHours: 16

The 16 credits towards the certificate must be taken from the above lists.

All courses used to satisfy certificate requirements must be passed with a grade of Cor higher. ( C - and P are not acceptable.)

INTERCULTURAL COMPETENCE FOR THE WORKPLACE UNDERGRADUATE CERTIFICATE

The Certificate in Intercultural Competence for the Workplace offers a focused trajectory of coursework options designed to enhance intercultural competence in professional and workplace settings. The required 16-27 credits (total number of credits varies according to the language a student studies and prior knowledge of language) can be completed as an integrated part of an undergraduate bachelor's degree or as a stand-alone course of study. The Certificate in Intercultural Competence for the Workplace would be completable within one academic year or, for students who have prior knowledge of a world language, 1-2 terms.

## AREA 1: WORLD LANGUAGE

Completion of one year of world language study, equivalent to 12 or 15 credits of first-year language, OR one 4- or 5-credit language course at the level of 103 or higher.

Subtotal: 4-15
AREA 2

| WLL 371 | Global Citizenship in <br> Professional Contexts | 4 |
| :--- | :--- | :--- |

Subtotal: 4

## AREA 3: ONE OF THE FOLLOWING:

| Comm 215 | Introduction to Intercultural | 4 |
| :--- | :--- | :--- |
|  | Communication |  |
| Intl | Understanding the International | 4 |
| $471 /$ Ling | Experience |  |
| 471 |  |  |

Subtotal: 4

## AREA 4: ONE OF THE FOLLOWING CLASSES ON SKILLS FOR THE

## GLOBAL/INTERNATIONAL WORKPLACE, RELATED TO THE STUDENT'S CAREER PATH.

A number of these courses require prerequisites so will only be appropriate for majors in those fields.

ChLa 380U Latinos in the Economy and 4
CR 307 Conflict ManagementSkills 4
CR 312 Intercultural Conflict Resolution 4
CR 423 Dialogue Across Differences 4
CR 441 Storytelling and Conflict 4
Fin 456 International Financial 4
Fr $320 \quad$ French for the Working W orld 4
Ger 320 German for the Working World 4
GSCM 439 Global Sourcing and Negotiation 4
Intl
349U/WS
349U
Intl375U
Intl380U Globalization, Representation
and Difference in Media and
Film
Intl470 Intercultural Leadership and 4
Change
Jpn 413 Advanced Japanese: Japanese 4
Jpn 477 Teaching Japanese As a Foreign 4
Mgmt $446 \quad$ Principles of International 4
Mktg $376 \quad$ International Business 4
Mktg 466 Principles of International 4
NAS 348 Indigenous Practices for 4
NAS 411 Nationhood: Tribal Sovereignty, 4
Governance \& Policy
Global Health
$\begin{array}{lll}\text { PHE 444U } & \text { Global Health } & 4 \\ \text { PS 352U } & \text { Introduction to European Politics } & 4\end{array}$
PS 353U Introduction to Latin American 4
PS 354U Introductionto Asian Politics 4
PS 355U Introductionto AfricanPolitics 4
PS 361U Introduction to the Politics of the 4
Psy 343 SocialPsychology:Social 4
Psy 361 Industrial Psychology 4
Psy 362 Organizational Psychology 4
Psy $426 \quad$ Psychology of Stigma \& Social 4

| Psy 470 | Diversity in the Workplace | 4 |
| :--- | :--- | :--- |
| Span 313 | Business \& Culture in the <br> Hispanic World <br> Spanish in Social and Legal <br> Span 314 | 4 |
| Span 316 | Spanish and Medical Culture | 4 |
| Span 317 | Spanish for Agriculture Puposes <br> USP 301U <br> Introduction to Community | 4 |
| Development |  |  |$\quad 4$

Subtotal: 4

## Total CreditHours: 16-27

At least 12 credits towards the certificate must be taken at PSU.

All courses used to satisfy certificate requirements mustbe passed with a grade of Cor higher. (C- and P are not acceptable.)

## WORLD LANGUAGE PEDAGOGY UNDERGRADUATE CERTIFICATE

The Certificate of World Language Pedagogy familiarizes students with the instructional methodology of teaching world languages. It is designed to fit into WLL major and minor programs as well as otherfields, including Applied Linguistics, Education, and Communication. It is especially suitable for people who have a high level of proficiency in a world language, wish to teach a world language at a private or public K-16 school in the US, or intend to apply to GTEP or other teacher education programs. Candidates may enroll as undergraduateor postbaccalaureate students. The certificate will be available in the following languages: Arabic, Chinese, French, German, Italian, Japanese, Pers ian, Rus sian and Spanish. Students are required to take a total of 20 upper-division credits covering the following four areas: 1 . Methods, 2 . Linguistics, 3 . Content, 4 . Practicum. They are expected to have a degree of language proficiency that is determined by each language section in order to qualify for the certificate. Students will have an adviser for the certificate who will guide themthrough the coursework.

## REQUIREMENTS

Students are required to take a total of 20 credits covering the following four areas: Methods, Linguistics, Content, and Practicum. Students are expected to have a language proficiency at the level required to complete Methods and Practicumcourses. The required level of proficiency is determined by each language section. Students will have an adviser for the certificate who will guide themthrough the coursework.

## Area 1: Methods (8 credits)

Students will take 2 courses fromamong the following methods courses in World Languages or Linguistics to earn a total of 8 credits in language teaching methods. With approval of an adviser, methods courses from other accredited institutions can be used. Ling 438 can only be applied to Area 1 or Area 2.

| Jpn 477 | Teaching Japanese As a Foreign <br> Language <br> Jpn 478 | Teaching Japanese As a Foreign |
| :--- | :--- | :--- |
|  | Language |  |
| Span 312 | Introductionto Teaching Spanish | 4 |
| WLL 498 | Methods of Teaching Foreign | 4 |
| Ling 477 | Languages | TESOL Methods I |
| Ling 438 | Second Language Acquisition | 4 |

## Area 2: Linguistics (4 credits)

Students will take one linguis tics course relevant to the world language of their choice from the following list. If a linguistics course is not available in their chosen language section, the course fromApplied Linguistics (Ling 390,
Ling 438) may be taken to meet this requirement. Ling 438 can only be applied to Area 1 or Area 2.
Ar414 Advanced Arabic Grammar 4

Ar 490 History of the Arabic Language 4
Chn 490 History of the Chinese Language 4
Fr $325 \quad$ French Phonetics and Phonology 4
Fr 414 Advanced French Grammar 4
Fr $490 \quad$ History of the French Language 4
Fr 494 French Linguistics 4
Fr 497 Applied FrenchLinguistics 4
Ger 414 Advanced German Grammar 4
Ger 490 History of the German Language 4
Ger 494 German Linguistics 4
Ger 497 Applied German Linguistics 4
It $390 \quad$ History of Italian Language 4
Jpn 414 Advanced Japanese Grammar 4
Jpn 494 Japanese Sociolinguistics 4
Rus 325 Russian Phonetics and 4
Rus $414 \quad$ Advanced Russian Grammar 4
Rus $494 \quad$ Russian Linguistics 4
Rus 497 Applied RussianLinguistics 4
Span 414 Advanced Spanish Grammar 4

Span 490
Span 494
Span 497
WLL 390
Span 498
Ling 390
Ling 438

History of the SpanishLanguage Spanish Linguistics Applied Spanish Linguistics Languages of the World Spanish Syntax


Introduction to Linguistics
Second Language Acquis ition

## Area3: Content (4 credits)

Students will take one course of literature, language, culture, or content area relevant to the language of their choice. The coursemay be taught in English or the target language. Upper division courses fromthe following areas may count towards this requirement: Arabic, Chinese, French, German, Italian, Japanese, Persian, Russian, Spanish, and World Languages and Literatures.

## Area 4: Practicum (4 credits)

Students will complete 4 credits of Practicumin the world language of their choice (Arabic, Chinese, French, German, Italian, Japanese, Pers ian, Rus sian, or Spanish). The total of 4 credits can be taken all at once or over multiple terms. At least 1 credit hour of practicumshould involve instructional experience supervised by WLL faculty in existing language courses, content courses, or in the community, (which would be pre-arranged by the adviser of the target language). The practicummay include practicumor internship experience abroad. Cooperative Education/Internship (404 with language prefix, e.g., Ar404) and Senior Capstone courses ("Japanese and
Chinese Language for Youth," "Bilingual Education," and
"Teaching/Tutoring Adult ESL") may substitute for Practicumcredits.

All credits should be 300 or above. They may include up to 12 credits taken outside of PSU's program, and credits earned through study abroad at a PSU's partner institution will be considered as residential credits.
Subtotal: 20
Total CreditHours: 20

## ADVANCED PROFICIENCY IN RUSSIAN CERTIFICATE (CAPR)

The Certificate of Advanced Proficiency in Russian (CAPR) is designed to permit students majoring in any subject to achieve Superior (professional) proficiency in Russian. Candidates may enroll in the programas undergraduate or as post-baccalaureate students.

## Admission requirements

Students who wish tocomplete the Certificate program must first be admitted to the Russian Flagship Program (RFP). Sponsored by The LanguageFlagship, RFP offers both Introductory and Adv anced tracks. See www.pdx.edu/russian-flagship/ for details.

## COURSE REQUIREMENTS

Students in the programtake five advanced Russian classes, three content classes conducted in Russian, and six Russian across thecurriculumclasses attached to the students' general education requirements and individual majors. Students complete their Senior Capstone in Russian.

## Courses

| Advanced Russian Language Classes (5 classes): |  |  |
| :---: | :--- | :--- |
| Rus 325 | Russian Phonetics and | 4 |
|  | Phonology |  |
| Rus 411 | Advanced Russian | 4 |
| Rus 412 | Advanced Russian | 4 |
| Rus 413 | Advanced Russian | 4 |
| Rus 414 | Advanced Russian Grammar | 4 |

Subtotal: 20
Content Classes (3 classes) chosen from:

| Rus 421 | Topics in Contemporary Russian <br> Culture | 4 |
| :--- | :--- | :--- |
| Rus 427 | Topics in Russian Literature of <br> the 19th Century | 4 |
| Rus 433 | Topics in Russian Literature of <br> the 20th Century | 4 |

Subtotal: 12

## Russian Across the Curriculum:

| Rus 444 | Flagship Studies: Globalization Term 1 | 2 |
| :---: | :---: | :---: |
| Rus 445 | Flagship Studies: Globalization Term 2 | 2 |
| Rus 446 | Flagship Studies: Globalization Term 3 | 2 |
| Rus 454 | Flagship Studies: American Studies | 2 |
| Rus 455 | Flagship Studies: European Studies | 2 |
| Rus 456 | Flagship Studies: Environmental Sustainability | 2 |
| Rus 457 | Flagship Studies: Russian in the Major Term 1 | 2 |
| Rus 458 | Flagship Studies: Russian in the Major Term 2 | 2 |
| Rus 459 | Flagship Studies: Russian in the Major Term 3 | 2 |
| UnSt 421 | Capstone | 6 |

Subtotal: 24
Subtotal: 56

## Total Credit Hours: 56

- All courses used to satisfy CAPR certificate requirements must be graded C or higher.


## TEACHING JAPANESE AS A FOREIGN LANGUAGE (TJFL) CERTIFICATE

This programis designed to familiarize participants with principles of instructional methods in teaching Japanese to speakers of languages whose orthography is not kanjibased. It is designed to fit into the programs of majors in a wide variety of fields, including Japanese, education, linguistics, and the social sciences. Candidates may enroll as post-baccalaureate students or while completing undergraduate degree requirements in another field.

## Admission requirements

1. Admis sion to Portland State University.
2. Japanese proficiency at the ACTFLIntermediate High level.
Students whose proficiency is lower may be provisionally admitted; they will need to study Japanese while taking other courses in the certificate program.

## COURSE REQUIREMENTS

To qualify for the TJFL certificate, the student must complete 16 credits in theoretical and applied linguistics (through the departments of World Languages and Literatures or Applied Linguistics), 16 credits in Japanese area studies (literature, history, anthropology, etc.), and 8 credits in TJFL Methods (Jpn 477, Jpn 478).

## Courses

| Linguistics | 16 |
| :--- | ---: |
| Area Studies | 16 |
| TJFL Methods | 8 |

Subtotal: 40
All courses used to satis fy certificatecourse requirements must be graded Corabove.

## FOREIGN LANGUAGE SECONDARY EDUCATION PROGRAM

Advisers: French, S. W alton; German, C. CollenbergGonzález; Japanese, S. Watanabe; Russian, W. Comer; Spanish, E. Nunez.

Students who wish to teach a foreign language in Oregon secondary schools must be admitted into the Graduate TeacherEducation Program(GTEP) in Portland State's College of Education and complete the requirements for an Oregon Teaching License. Admis sion to GTEP as a foreign-language specialistrequires a bachelor's degree or equivalent preparation in a world language taught in Oregon schools and the recommendation of the Department of World Languages and Literatures. For other criteria, please refer to the College of Education section of this Bulletin.

In order to be recommended by the department, the applicant musthave:

1. Applied for admis sion to the Graduate Teacher Education Programin the College of Education (see Graduate Teacher Education Program(p. 150)).
2. Completed a B.A. or B.S. which includes coursework equivalent to the 52 credits required for a major in one foreign language at Portland State University.
3. Maintained a 3.00 GPA in the last 40 of the above 52 credits earned.
4. Obtained an Oral Proficiency Rating of Advanced High or higher on the ACTFLscale in French, German, or Spanish, or a rating of Intermediate High or higher in Japanese or Russian.

The Department of World Languages and Literatures highly recommends that applicants earn upper-division credits in their chosen language beyond the minimum of 52 required; that they spend time in a relevant program abroad; and that their coursework include as many of the following as possible: Phonetics, GeneralLinguistics, Applied Linguistics, Culture and Civilization, Practicum, and Methods of Teaching Foreign Languages.

## Graduate programs

The Department of W orld Languages and Literatures offers degree programs leading to the M.A. in World Language with a major in German, Japanese, or Spanish, and the M.A. in World Languages and Literatures, with a concentration in two world literatures and linguistics. Admis sion to the MA in French has been suspended effective fall 2020, and no applications are being accepted at this time.

## ADMISSION REQUIREMENTS

All applicants for admission must meet the University admis sions requirements (p.8).

## Master of Arts in World Language

Applicants for admis sion mustalso meet the following departmental requirements:

1. A Bachelor of Arts degree or its equivalent in the major language, with a minimum GPA of 3.00 in all coursework.
2. Oral and written proficiency: Advanced High on the ACTFL scale in French, German, and Spanish; Advanced Low in Japanese.
Master of Arts in World Languages and
Literatures
Applicants for admission mustals o meet the following departmental requirements:
3. In the primary language:
a. Bachelor of Arts in the language with a 3.00 GPA in the literature courses, or its equivalent as determined by the Department;
b. Oral and written proficiency: Advanced High on ACTFL scale
4. In the secondary language: Demonstration of third-year proficiency.

DEUTSCHE SOMMERSCHULE AM PAZIFIK
Graduate credits earned in German through the Deutsche Sommerschule amPazifik (DSaP) can be accepted as inresidence credit at Portland State University only if taken after formal admis sion to the M.A. in World Language programin German or the M.A. in World Languages and Literatures in German. Graduate credit earned at the DSaP prior to admis sion to either programis normally limited to 15 credits, in accordance with the University's transfer regulations.

An M.A. degree in German earned solely by attendance at the Sommers chule normally entails four summers' work plus the thesis or the non-thesis option.

## WORLD LANGUAGE M.A.

The M.A. in World Language is a graduate degree with a major in German, Japanese, or Spanish language and literature. Admission to the MA in French has been suspended effective fall2020, and no applications are being accepted at this time. (Students interested in studying French at the M.A. level are encouraged to apply to the World Languages and Literatures M.A. with French as a secondary language. Details are available in the section below.) It is available with a thes is and a non-thesis option. Students should consult with their adviser to determine the best option.

A candidate for the Master of Arts in World Language must complete a minimum of 45 graduate credits, of which 30 must be taken in residence after admission to the degree program. The 45 credits are to be distributed as follows:

## REQUIREMENTS

| Thesis option |  |  |
| :--- | :--- | ---: |
| WLL 560 | Principles of Scholarly Research | 4 |
| WLL 598 | Methods of Teaching Foreign | 4 |
|  | Languages |  |
| 503 | Thesis | $6-9$ |
|  | Additional adviser-approved | $20-$ |
|  | 500-level coursework | 23 |


| Credits from 551,552,553 |  |  |
| :---: | :---: | :---: |
|  | Eight graduate credits chosen from 551, 552, 553 | 8 |
| Subtotal: 45 |  |  |
| Non-thesis option |  |  |
| WLL 560 | Principles of Scholarly Research | 4 |
| WLL 598 | Methods of Teaching Foreign Languages | 4 |
| 501 | Research | 6-9 |
|  | or |  |
|  | Other adviser-approved 500levelcredits | 6-9 |
|  | Additional adviser-approved 500-level coursework | $\begin{array}{r} 20- \\ 23 \end{array}$ |
| Credits from 551,552,553 |  |  |
|  | Eight graduate credits chosen from 551, 552, 553 | 8 |

## Subtotal: 45

Note: The student's programmay include, with an adviser's approval, a maximum of 12 credits in 501 and/or 505 and a maximum of 9 credits in 508 and/or 509 combined. See Credit Distribution and Limitations for Master's Degrees.

In addition to the required coursework, the candidate will have to:

- Thesis option: Submit a thes is, written in either the foreign language or in English, and pass a final examination (in Span this includes both written and oral examinations) in accordance with University requirements.
- Non-thesis option: Submit two research papers in different adviser-approved subject areas, written either in the foreign language or in English, and pass a final written and oralexamination.


## WORLD LANGUAGES AND LITERATURES M.A.

The M.A. in World Languages and Literatures is a graduate degree with concentration in a primary language, a secondary language, and in linguistics. The primary language may be German or Spanish; the secondary language may be Arabic, French, German, Japanese, Russian, or Spanish. Admis sion to the MA in French has been suspended and no applications are being accepted at this time. Students may still apply for the MA with French as a secondary language.

## REQUIREMENTS

A minimum of 60 credits, of which 40 must be earned in residence, dis tributed among the following areas:

## Primary language

| General WLL 560 | Principles of Scholarly Research | 4 |
| :---: | :---: | :---: |
| Credits from 551,552,553 |  |  |
|  | Eight graduate credits chosen from 551, 552, 553 | 8 |
| Other |  |  |
|  | Other adviser-approved 500levelcourses | 16 |


|  |  | Subtotal: 28 |
| :--- | :--- | :--- |
| Secondary language |  |  |
| Fight graduate credits chosen from: |  |  |
| 511 | Advanced Language |  |
| 512 | Advanced Language | 4 |
| 514 | Advanced Language | 4 |
| 516 | Advanced Language | 4 |
| 517 | Advanced Language | 4 |

Twelve graduate credits chosen from:

| 500 -level literature | 12 |
| :---: | :---: |
|  | Subtotal: 20 |

Note: 500 -level literature may not include Literature in Translation.

Note:If upper-division courses in fourth-year language have been successfully completed at the undergraduate level(with a GPA of 3.00 or above), theequivalent number of Advanced Language credits can be waived, reducing the total credits required by a maximum of 8 .

## Linguistics and methods

| 12 graduate credits chosen from: |  |  |
| :---: | :---: | :---: |
| WLL 593 | Language Proficiency Testing and Teaching | 4 |
| WLL 598 | Methods of Teaching Foreign Languages | 4 |
| Fr 590 | History of the FrenchLanguage | 4 |
| Ger 584 | German Stylistics | 4 |
| Ger 594 | German Linguistics | 4 |
| Ger 597 | Applied German Linguistics | 4 |
| Jpn 552 | Japanese Language and Linguistics | 4 |
| Jpn 577 | Teaching Japanese As a Foreign Language | 4 |
| Jpn 578 | Teaching Japanese As a Foreign Language | 4 |
| Jpn 594 | Japanese Sociolinguistics | 4 |
| Span 590 | History of the SpanishLanguage | 4 |
| Span 594 | Spanish Linguistics | 4 |
| Span 595 | Spanish Dialectology | 4 |
| Span 597 | Applied SpanishLinguistics | 4 |
| Span 598 | Spanish Syntax | 4 |

Subtotal: 12

Subtotal: 60
In addition to the required coursework, the candidate will have to:

- Submit two research papers to the graduate committee, one dealing with the primary, the other with the secondary area. These may be written either in the primary or secondary languages, respectively, or in English.
- Pass a finalcomprehensive written and oral examination overcoursework taken in the primary and secondary areas and over the research papers.


## OHSU-PSU SCHOOL OF PUBLIC HEALTH

Rick Johnson, InterimDean
Karen Camp, AssociateDean for Finance and Administration
Betty Izumi, Interim AssociateDean forStudent and Alumni Affairs
Marguerita Lightfoot, Associate Dean for Research Dawn Richardson, Associate Dean for Social Justice and Interim As sociate Dean for Academic and Faculty Affairs Emily Kemmerer, AssistantDean for Student and Alumni Affairs
Brad Wipfli, Interim Assistant Dean for Graduate Academic Affairs
Belinda Zeidler, AssistantDean for Undergraduate Academic Affairs
ohsu-psu-sph.org

- B.A., B.S. -Public Health Studies, Applied Health and Fitness
- UndergraduateCertificate in Human Lactation
- Minors in Community Health, Aging Services
- Graduate Certificates in Biostatistics, Public Health
- M.S.-Biostatistics
- M.P.H. - Biostatistics, Environmental Systems and Human Health, Epidemiology, Health Management and Policy, Health Promotion, Public Health Practice (online)
- Ph.D. - Community Health, Epidemiology, Health Systems and Policy


## About the School of Public Health

Ending health disparity, in Oregon and around the globe
The School of Public Health unites two of Oregon's leading universities to educate the next generation of public health leaders, with a vision of ending health disparities in Oregon and around the globe. This unique collaboration combines the strengths of a world-class academic health center with the deep community involvement and diversity of the state's only urban research university. Our vision is to be the premier destination in Oregon for students of all backgrounds who want to enter the health field and improve lives in their communities.

## Collaboration

Two universities, one mission: Better healthfor all
Oregon Health \& Science University is known internationally for groundbreaking and life-saving research in cancer and medicine. Portland State University is a national model for community engagement and academic innovation. Together, the two universities offer unmatched
opportunity for students to learn in the clas sroom and apply that knowledge and in real-world settings.

## Access \& Equity

A vision of health equity
One of our top goals is to increase the number of underserved and historically marginalized students in the health field. This serves two purposes: to ensure a diverse student body and to enable students to help end health disparities by working in communities that are negatively affected by social, environmental, and health system limitations. Part of our mission is to be an access university, we take pride in the number of students we accept, nothow many we reject.

## Value

Research + engagement: The best ofboth worlds
The deep community engagement of PSU faculty and biomedical research expertise at OHSU give students direct access to two distinct but connected areas of academic excellence. Graduates emerge with degrees endorsed by both universities in a field where demand is growing rapidly.

## Expanding Role of Public Health Building healthy populations

With a focus on healthy populations rather than individuals, public health seeks to understand the foundations and social determinants of health and works to resolve disparities. Nutrition, maternal-child health, gun violence, health policy, health literacy and homelessness are only some of the factors in ending health dis parities. Populations can be as small as a local neighborhood or as big as an entire region of the world.

## Community Partnerships

Connecting with the community
PSU and OHSU have an established network of local and regional partners, including clinics, governmental agencies and nonprofit agencies. This network offers students a wealth of opportunity for internships, hands-on learning and contacts for future employment.

## Affordability

An affordable degree with excellent ROI
The cost of a degree fromthe OHSU-PSU School of Public Health is among the lowest in Oregon and far lower than similar degrees fromprivate colleges. Graduates enter health fields that offer above-average salaries, along with opportunities to work anywhere in the world.

## Demand for Graduates

Boundless career opportunities

The health workforce is reaching retirement age, creating a significant gap between demand and supply of health workers in the near future. Graduates can expect a robust career market.

## Doctoral programs

## COMMUNITY HEALTH PH.D.

The Community Health programis an interdisciplinary course of study providing students with specialized training in public health promotion. Students will learn to address factors in the broader social, economic, policy and built environments to improve the health of populations. In this program, students build practice and research skills for population-level interventions-including program development, implementation and evaluation. The curriculumfurther offers opportunities to focus on health across the lifespan. Graduates of the Community Health programwill be able to effectively recognize and assess health disparities, promote health equity, and mobilize res ources for social change.
Students admitted with a Master's Degree in Public Health take will take the required coursework as shown. Students admitted with an undergraduate degree or a graduate degree other than a Master in Public Health will be required to take EPI612 Epidemiology I and PHE511 Foundations of Public Health as electives.

For more information and instructions on how to apply visit the PhD in Community Health web page.

## DEGREE REQUIREMENTS

| Health Core <br> PHE 612 | Principles of Health Behavior <br> PHE 546 | 3 |
| :--- | :--- | :--- |
| PHE 622 | Urban and Community Health and Social Inequalities | 3 |
| PHE 623 | Doctoral Seminarin Health <br> Research | 1 |
| PHE | Teaching and Learning in Health | 3 |
| 626/SW 626 | Promotion \& Social Work |  |
| HSMP 671 | Health Policy |  |
| HSMP 673 | Values and Ethics in Health <br> ESHH 612 | Global \& Planetary Health <br> Concepts |
| PHE 632 | DevelopmentalOrigins of Health <br> and Disease (DOHaD)- | 3 |
| HSMP 681 | Epidemiology <br> Population Health:Policy and | 3 |
| PHE 619 | Practice Implications <br> Mentored TeachingExperience | 4 |

Subtotal: 37
Students are required to be enrolled in the 1-credit per quarter PHE623 Doctoral Seminar in Health Research for a total of 6 credits during the first two years ( 6 quarters) of
the program. The DoctoralSeminar in Health Research will meet weekly with a faculty instructor on topics such as the criticalevaluation of health research, hypothesis generation, publication and review process, grant application process, and programrequirements.

| Methods Core <br> PHE 520 | Qualitative Research Design <br> PHE 624 <br> From Philosophy through Power <br> Calculations: Writing Methods | 3 |
| :--- | :--- | :--- |
| PHE 625 | Sections for ResearchProposals <br> Advanced Methods Toolkit: <br> Design, Sampling, Scale <br> Development, \& More | 3 |
| PHE 634 |  <br> Theory | 3 |
| BSTA 611 | Estimation and Hypothesis | 4 |
| BSTA 612 | Testing for Applied Biostatistics <br> CPH 636 | Linear Models <br> Community Based Participatory <br> Research |

Subtotal: 23
The required methods courses will cover traditional epidemiological as well as other social scienceresearch methods. Competencies will include study design, sampling, measurement, evaluation, qualitative research and analysis.

## Eectives

## Methods Electives

In addition to the required methods courses, students must enroll in at least 6 credits of methods electives. Elective course selections must be approved by the student's advisor.

## Substantive Area Electives

Students must also take at least 12 credits of electives on health topics related to whichever of the three defined areas of emph as is the student has chosen (i.e., social and behavioral health, aging and health, or urban health) or otherwise related to the student's interests and approved by the student's advisor.

Subtotal: 21

## Comprehensive Exam

The written and oral comprehensive examination is taken after the student has finis hed all required and elective coursework. Forfull-time students, this exam is expected to take place during the fall term of the student's third year. Scheduling of this examfor part-time students will be negotiated by the student and his/her advisor.

## Dissertation

Upon successful completion of the comprehensiveexam, the student will form a committee of 4 faculty members and a Graduate Office representative who will help guide
the preparation of the dis sertation proposal. After committee approval of the student's written and oral presentation of a dissertation proposal, then approval of the project by the University Human Subjects Research Review Committee application, the student will advance to doctoral candidacy. Students must complete at least 27 credits of PHE 603 Dissertation credits, in addition to having an approved written dis sertation and successful oral defense of the dis sertation, to be eligible for graduation. The PHE603 Dis sertation credits are byarrangement credits s upervised by the PHEadvis or or the dis sertation chair (faculty within PHE). Continuous regis tration with a minimum of 1 PHE 603 Dis sertation credit is required while engaged in dis sertation res earch.

Subtotal: 27

## Total CreditHours: 108

## Other Professional Development

The core curriculumhas a strong emphasis on community engagement, research mentorship, critical evaluation of research, and professional development. Doctoral students, however, are expected to do more than simply fulfill degree requirements while in the Community Health doctoral program. Some of these extracurricular activities, such as attending lecture series, works hops, and brown bag seminars, are expected of any member of the community of scholars. Other activities, such as serving as research or teaching assistants, provide opportunities for professional development, publication, presentation at conferences, and remuneration.

## EPIDEMIOLOGY PH.D.

Epidemiology is the study of the distribution and determinants of disease frequency in human populations. It is a fundamental science of public health and medicine enabling es timation of dise ase burden, assessment of risk and resilience factors, and assessment of interventions to reduce disease burden over time. Epidemiology requires a foundation of coursework in epidemiologic methods, biostatistical analysis, and public health disciplines. Epidemiologists with doctorates focus on the causes and prevention of disease in human populations, as well as methods to advanceepidemiologic research. Objectives Graduates of the OHSU-PSU School of Public Health PhD Programin Epidemiology will acquire the advanced quantitative and analytical skills needed to conduct innovative independentresearch that advances knowledge of the etiology, prevention, and amelioration of human disease. They will be prepared for positions as scientists in a wide range of public health settings, including universities, federal and state agencies, business, and industry.

## Core Competencies

Students graduating fromthis programwill be able to:
Apply population-based concepts of chronic and infectious disease epidemiology within appropriate biological, pathophysiological, social, and community contexts.

Apply methods for collecting, evaluating, and synthesizing existing evidence of health determinants to research on public health problems.

Apply appropriate data quality assurance and statis tical methods for the research questions and study designs used in epidemiologic research.

Formulate a tes table hypothesis and propose a related study design and analytic approach that have the potential for advancing knowledge of the determinants of health and disease.

Apply ethical principles to problems that arisein epidemiologic research and practice.

Evaluate scientific, cultural, and political is sues on epidemiologic research, including research goals, recruitment of study participants, and communication of results in the appropriate contexts.

Demons trate excellent verbal and communication skills in teaching epidemiologic principles and concepts at appropriate levels to different audiences.

For more information and instructions on how to apply visit the PhD in Epidemiology web page.

## CORE REQUIREMENTS

| Epidemiology | Core |  |
| :--- | :--- | :--- |
| Epi 613 | Epidemiology II | 4 |
| Epi 614 | Epidemiology III | 4 |
| Epi 636 | Epidemiological Data Analysis \& | 4 |
|  | Interpretation |  |
| Epi 630 | Epidemiology Journal Club | 1 |
| Epi 610 | Epidemiology Doctoral Seminar | 3 |
| Epi 640 | Research Proposal and Design | 3 |
| Epi 668 | Infectious Disease Epidemiology | 2 |
| Epi 676 | Chronic DiseaseEpidemiology | 2 |

Subtotal: 24

## Biostatistics Core

BSTA 612 Linear Models
4
BSTA 613 CategoricalData Analysis 3
BSTA 515 Data Management \& Analysis in 3 SAS

BSTA 514 Statistical Analysis of Time-to-
3 Event Data
or

| BSTA 519 | Applied Longitudinal Data Analysis | 3 |
| :---: | :---: | :---: |
| Subtotal: 14 |  |  |
| Public Health Core |  |  |
| Conj 650 | Scientific Ethics or | 1 |
| HSMP 673 | Values and Ethics in Health | 3 |
| PHE 622 | Health and Social Inequalities | 3 |
| PHE 612 | Principles of Health Behavior | 3 |
| ESHH 611 | Concepts of Environmental Health | 3 |
| HSMP674 | Health Systems Organization | 3 |
| Subtotal: 13-15 |  |  |
| Mentored Teaching |  |  |
| Epi 660 | Mentored Epidemiology | 1 |
|  | Teaching |  |

Subtotal: 1

## Epidemiology Dissertation

| Epi 603 | Epidemiology Dissertation | $27-$ |
| :--- | :--- | ---: |
|  | Credits | 29 |

Subtotal: 27-29

## ELECTIVES

## Methods Electives

Courses chosen frompre-approved list or in consultation with programdirector and advisor.

- No more than 6 of 12 required credits can be met with Epi 650 Mentored Epidemiology Research.
- Courses selected relevant to course of study and neces sity to meet credit requirements.
- Courses must be chose so that programrequirements are met with no more than 27 credits (required plus elective) at the 500-level.

Subtotal: 12

## Other Approved Electives

Courses selected relevant to course of study and necessity to meet credit requirements.

Courses must be chosen so that programrequirements are met with no more than 27 credits (required plus elective) at the 500-level.

Subtotal: 15-17
Dis sertation and elective credit totals vary based on number of dis sertation credits students complete. Subtotal: 27-29
Total Credit Hours: 108

HEALTH SYSTEMS AND POLICY PH.D.
The Doctoral Programin Health Systems and Policy (HS\&P) is an interdisciplinary programof study. It is administered through the OHSU - PSU School of Public Health and draws on faculty with educational backg rounds in public health, health policy, health services research, public affairs, management, economics, epidemiology, social work, psychology, systems science, and sociology from the OHSU - PSU School of Public Health, PSU's College of Urban and Public Affairs, and other academic units at Portland State University (PSU) and Oregon Health \& Science University (OHSU). The programis designed to provide doctoral students with advanced knowledge, analytic skills, and competencies in conducting research and developing teaching and learning skills in health systems and policy with foundations in public health, management theory, health services research, and policy analysis. The programprovides a unique educational experience for students interested in immediately applying theory to practice as they prepare for careers as researchers and teachers.

The HS\&P curriculumincludes core content in health systems and public health, extensive study of policy domains and applications, and intensive training in research methods and research design. This program design helps students to integrate coursework with applied research and practice, and emphasizes community -engaged learning and scholarship reflecting the mission of the SPH.

Students in the HS\&P PhD programwill master the following competencies by graduation.

## ProgramCompetencies

- Apply relevant theories and frameworks to is sues pertaining to health systems and policies.
- Select and apply appropriate qualitative and quantitative research techniques to identify strategies to improve health systemeffectiveness.
- Formulate a tes table research question and propose a relevant study design and analytic approach that has the potential to advance knowledge of health systems and policy.
- Conductan independent study that demonstrates synthesis of knowledge and application of research skills.
- Apply principles of ethics and cultural competence when conducting health systems and policy research and education
- Evaluate evidence-based public health policy and health systems transformation strategies to identify emerging issues in health systems and policy.
- Create and deliver effective presentations of scholarly activities to academic and lay audiences.

The HS\&P curriculumreflects the vision, mis sion and competencies of the OHSU-PSU School of Public Health. It prepares graduates to address the social determinants of health, and lead in the implementation of new approaches and policies to improve the health of populations. The curriculumis framed around seven competencies that reflect theexpectations of doctoral programs in public health. The HS\&P programincludes core curricular content in health systems and public health, extensive study of policy domains and applications, and intensive training in research methods and research design. The curriculumis designed to help students integrate coursework with applied research and practice, and emphasizes community-engaged learning and scholarship.
For more information and instructions on how to apply vis it the PhD in Health Systems and Policy web page.

## DEGREE REQUIREMENTS

## Prerequisites

Admitted students who have completed a relevant masters degree in health management/policy will be able to waive portions of the required curriculum. Allstudents are required to fulfill prerequisite courses of the equivalent of Epidemiology I, Introduction to Biostatistics, and Foundations of Public Health; students entering with an MPH will usually have completed such content.

## Credit requirements

The programincludes a minimum of 103 required credits, including 21 credits in required core courses, $18-22$ credits in policy courses, 12 credits in health systems courses, and 19-23 credits in research design and analytic methods courses. Students are required to enroll in a one-credit health systems and policy dissertation seminareach quarter during their first two years of coursework to help prepare themfor the dissertation process (up to 6 credits). Finally, students complete 27 credits of dis sertation preparation. Additional major requirements include a written and oral comprehensive examat the completion of course requirements and before adv ancement to the dissertation, a written dissertation proposal with an oral defense, and a final written dissertation with an oral defense.
The credits are distributed as follows:
Required core courses 21
Policy Courses 18-
${ }^{22}$
Health systems courses 12
Research design and Analytic 19-
methods 23
Dissertation seminar 6
Dis sertation credits 27

Subtotal: 103-111
Each admitted student's past masters coursework will be reviewed upon admis sion and a determination made regarding waiver of courses. A programof study will then be developed with the assigned advisor. No waiver of credit will be given forprofessional experience.

## Core coursework

The required core courses ( 21 credits) should be completed early in the programof study.

| HSMP642 | Organizational Theory and <br> Health Systems | 3 |
| :--- | :--- | :--- |
| HSMP 671 | Health Policy | 3 |
| HSMP 673 | Values and Ethics in Health | 3 |
| HSMP674 | Health Systems Organization | 3 |
| HSMP 677 | Health Care Law and Regulation | 3 |
| HSMP686 | Introduction to Health | 3 |
| HSMP660 | Economics <br> Contemporary Researchin <br> Health Systems and Policy | 3 |

NOTE: A student who has completed an MPH in health management and policy or a comparable masters degree could potentially waive some of the courses in the core.

## Policy coursework

Three courses are required; students then select three electives based upon their interests in relevant policy domains ( $18-22$ credits total). Relevant electives are listed on the School of Public Health website and in the HS\&P programguide.

| HSMP675 | Advanced Health Policy | 3 |
| :--- | :--- | ---: |
| PAP616 | Policy Process | 3 |
| USP 615 | Economic Analy sis of Public <br> Policy <br> HSMP 683 |  <br> Policy |
|  | Three policy electives | $9-12$ |

## Health systems coursework

Two courses are required; students then select two electives based upon their interests in health systems ( 12 credits total). Relevant electives are listed on the School of Public Health website and in the HS\&P programguide.

| PHE 622 | Health and Social Inequalities | 3 |
| :--- | :--- | :--- |
| HSMP 681 | Population Health:Policy and <br>  <br> $\quad$Practice Implications <br> Two health systems electives | 6 |

## Research design and analytic methods cours ework

Three courses are required; students then select two electives based upon their interests in health systems (1923 credits total). Relevantelectives are listed on the School of Public Health website and in the HS\&P program guide.

| HSMP689 | Research Design in Health <br> Soc 638 | Services <br> Integrating Qualitative and <br> Quantitative Methods |
| :--- | :--- | ---: |
|  | QHE 520 | Qualitative Research Design |
| USP 683 | or | 4 |
|  | Qualitative Analysis | 3 |
|  | Research Design and Analytic <br> Methods Electives | $9-12$ |

## Doctoral seminar in health systems andpolicy

Students enroll in a one-credit seminar (HSMP 607) each quarter during their first two years to help prepare themfor the dissertation process; they are encouraged to continue to attend the seminar throughout their entire program. The seminar meets regularly with a selected faculty mentor to discuss research topics, including critical evaluation of health systems and policy research, framing research questions, proposal writing, the grant application process, data collection and synthesis, human subjects review, dis sertation writing and presentation, the review process, programrequirements, and publication opportunities. Students present their developing work at the seminar to receive peer feedback. HSMP 607 DoctoralSeminar may be taken for up to 6 credits.

## Comprehensive examination

Students must pass a written and oral comprehensive examination at the conclusion of course requirements before they may proceed to the dis sertation. This examination assesses the student's competence in integrating, analyzing and critiquing the diverse bodies of knowledge covered in the HS\&P curriculum. The examination committee consists of three HS\&P/SPH faculty.

## Dissertation research

The dis sertation process is designed to evaluate the student's ability to successfully conduct a substantial, independent, applied research project. The dissertation represents the culmination of a student's doctoral studies. The dissertation is critiqued by the dis sertation committee, and presented in an oral defense. The dis sertation committee consists of 4-5 relevant HS\&P or SPH faculty, and one external member. Students register for HSMP 603 Dis sertation Research for a minimum of 27 credits during the research and writing of the dissertation.

Total Credit Hours: 103-111

## RESEARCH AND TEACHING OPPORTUNITIES

The HS\&P programoffers students a number of research and teaching opportunities.

## Graduate research assistantships

Dependent on available funds, graduate research assis tantships are available each year with faculty in the School of Public Health and in various research centers. Assistantships pay tuition and a small stipend. Additional summer research opportunities may be available.

## Teaching opportunities

Doctoral students may wish to gain experience teaching prior to completing their program. There are a number of opportunities available within the School of Public Health, the Hatfield School of Government, the College of Urban and Public Affairs, and PSU's University Studies program. More information is available in the HS\&P programguide.

## Graduate programs

The School of Public Health graduate programs are designed to prepare students for professional work in the fields of community health, health promotion, health management, and health policy in a wide variety of settings. Students may also complete a plan of study that prepares themto pursue a doctoral degree in a healthrelated area.

The School of Public Health offers eight graduate degrees.

1. A Master of Public Health (M.P.H.) degree in Health Promotion.
2. A Master of Public Health (M.P.H.) degree in Health Management and Policy.
3. A Master of Public Health (M.P.H.) degree in Biostatistics
4. A Master of Public Health (M.P.H.) degree in Environmental Systems and Human Health
5. A Master of Public Health (M.P.H.) degree in Public Health Practice
6. A Master of Public Health (M.P.H.) degree in Epidemiology
7. A Master of Science (M.S.) degree in Biostatistics.

Students with a wide variety of undergraduate degrees and profes sional experience are admitted to the School of Public Health.

## BIOSTATISTICS MPH

The MPH Biostatistics programprovides training for biostatistics methods as they apply to public health. Courses in this programemphasize intermediate to advanced applied statistical methods and statistical programming commonly used in public health research and practice, and programcompetencies highlight populationbased study design, analytic methods, data interpretation, and communication. Epidemiological study design and methods are also an important component of the training provided by this program. Graduates of the program will be equipped to pursue careers in local, state and federal agencies, health and medical centers, and research institutions.

## Program Competencies

Students graduating fromthis programwill be able to:

- Apply appropriate principles of research design and population-based concepts to assess health problems;
- Apply appropriate descriptive and inferential statistical methods to analyze risk determinants of disease and health conditions;
- Apply descriptive and inferential statisticalmethods that are appropriate to the different study designs used in public health research;
- Interpret and summarize results and communicate them to lay and professional audiences, in the context of proper public health principles and concepts;
- Evaluate strengths and weaknesses of alternative research designs and analytic methods, and critically review and assess statistical analyses presented in public health literature.
- Apply basic ethical principles pertaining to the collection, maintenance, use, and dissemination of public health data.
- Identify cultural dimensions of conducting research, including culturally sensitive recruitment of study participants, and develop strateg ies for interpretation of data in the larger cultural context.


## CORE REQUIRED COURSEWORK (22 CREDITS)

Testing for Applied Biostatistics
Epi 512 Epidemiology I
4
ESHH 511 Concepts of Environmental 3

| HSMP 574 | Health Systems Organization | 3 |
| :--- | :--- | ---: |
| PHE 512 | Principles ofHealth Behavior | 3 |
| Exam | Certified in Public Health | Pass |
| Bsta 502 | Examination <br> Integrative Learning Experience | 1 |
| Bsta 509 | and Paper <br> Exam | IntegrativeLearning Experience <br> Biostatistics Comprehensive |
|  | Examination | Pass |
|  |  |  |

PROGRAM REQUIRED COURSEWORK (28 CREDITS)

| UNI 504 | Qualitative Methods for Health <br> Profes sionals | 2 |
| :--- | :--- | :--- |
| BSTA 512 | Linear Models |  |
| BSTA 513 | CategoricalData Analysis | 4 |
| BSTA 515 | Data Management \& Analysis in | 3 |
|  | SAS |  |
| BSTA 516 | Design and Analysis of Surveys | 3 |
| BSTA 519 | Applied Longitudinal Data | 3 |
|  | Analysis |  |
| HSMP 573 | Values and Ethics in Health | 3 |
| Epi 513 | Epidemiology II | 4 |
| Epi 566 | Current Issues in Public Health | 2 |

ELECTIVE COURSES FROM THE
FOLLOWING (10 CREDITS)

| Bsta 500 | Reading and Research in <br> Biostatistics | $1-3$ |
| :--- | :--- | ---: |
| BSTA 514 | Statistical Analysis of Time-to- <br> Event Data | 3 |
| BSTA 517 | Statistical Methods in Clinical <br> Trials | 3 |
| BSTA 521 | Bayesian Methods for Data <br> Analy sis | 3 |
| BSTA 522 | Statistical Learning and Data | 3 |
| BSTA 523 | Science <br> Design and Analysis of <br> Experimental Designs | 3 |
| BSTA 524 | Statistical Methods for Next Gen | 3 |
| BSTA 550 | Sequencing <br> Intro to Probability | 3 |
| BSTA 551 | Statistical Inference I <br> BSTA 552 | Statistical Inference II <br> Epi 514 |
| Epidemiology III |  |  |
| PHE 519 | Introductionto the Etiology of | 3 |
|  | Disease | 3 |

## Total Credit Hours: 60

For more information and instructions on how to apply to the programvisit the MPH in Biostatistics web page.

## ENVIRONMENTAL SYSTEMS AND HUMAN HEALTH MPH

The MPH in Environmental Systems \& Human Health (ESHH) programoffers ecosystem-based public health training for students who would like to investigate and remediate environmental impacts on human health. Believing that a healthy en vironment is a cornerstone of preventive medicine, the goal of the ESHH track is to produce graduates who will be able to analyze relationships between human activities, the environment, and human health. Areas of emphasis include environmental change and its effect on human health, environmental pathogens, en vironmental transport, fate and remediation of chemicalcontaminants, food web bioaccumulation, wastewater treatment, environmental risk assessment and toxicity testing, culturally competent risk communication, and social justice issues. Within the programs pecial attention will be given to mediating and modifying the effects of environmental disruptions on the health of vulnerable populations in a culturally competent, ethical manner.

## Program Competencies

Students graduating fromthis programwill be able to:

- Communicate the relationship between environmental systems and human health, particularly in response to a changing climate.
- Analyze how environmental hazards (chemical, physical and biological) interact with natural and built systems, including the mechanis ms of their adverse effects on humans.
- Assess and interpret relevant literature in the area of public health andenvironmental hazards.
- Evaluate the risk of environmental exposures to human populations through the incorporation of exposure, toxicological, and other relevant data into risk as sessment methodology.
- Discuss how federal and state regulatory programs, guidelines and authorities impact environmental and occupationalhealth is sues.
- Apply ethical principles that govern the practice of environmental risk as sessment, management, and communication.
- Specify approaches for as sessing, preventing and controlling environmental and occupational hazards that pose risks to human health and safety.
- Integrate, synthesize and apply theory to practice in the context of a research study, policy consequences, or environmental exposure.
- Explain the general mechanis ms of toxicity in eliciting a human health effect in response to various environmental and occupational exposures.

| Program Required Coursework |  |  |
| :--- | :--- | :--- |
| UNI 504 | Qualitative Methods for Health <br> Professionals | 2 |
| ESHH 519 | Environmental Health in a <br> Changing World | 3 |
| ESHH 529 |  <br> Risk Assessment | 4 |
| ESHH 521 | Principles of Occupational <br> Health | 4 |
| HSMP 573 | Values and Ethics in Health | 3 |

Subtotal: 16
Core Required Coursework

| BSTA 525 | Introduction to Biostatistics | 4 |
| :--- | :--- | :--- |
| Epi 512 | Epidemiology I | 4 |
| ESHH 511 | Concepts of Environmental | 3 |
|  | Health |  |
| HSMP 574 | Health Systems Organization | 3 |
| PHE 512 | Principles of Health Behavior | 3 |
| Exam | Certified in Public Health | 0 |
|  | Examination |  |
| ESHH 502 | Integrative Experience and Paper | 1 |
| ESHH 509 | Practice Experience | 4 |

Subtotal: 22

## Eective Coursework

Electives commonly taken:

| ESHH 512 | Global \& Planetary Health <br> Concepts <br> Environmental and Occupational | 3 |
| :--- | :--- | :--- |
| ESHH 530 | Health Chemis try |  |
| ESHH 532 | Ecological Public Health <br> Geographic Information Systems | 3 |
| CPH 515 | for Public Health | 4 |
| Epi 513 | Epidemiology II | 4 |
| Epi 514 511 | Epidemiology III | 4 |
| PHE 511 | Foundations of Public Health <br> PHE 517 | 3 |
| PHE 519 | Introduction Organizing the Etiology of | 3 |
| PHE 520 | Disease <br> Qualitative Research Design | 3 |
| PHE 521 | Quantitative Research Design <br> and Analysis | 3 |
| PHE 540 | Mas Media and Health | 3 |
| ESM 552 | Environmental Regulation and <br> Non-regulatory Approaches | 3 |
| ESM 570 | Methods for Informal <br> Environmental Education | 4 |
| ESM 588 | Environmental Sustainability | 4 |


| Geog | Geographic Information Systems | 4 |
| :--- | :--- | :--- |
| 588/USP | I: Introduction |  |
| 591 |  |  |
| Geog | Geographic Information Systems | 4 |
| $592 / \mathrm{USP}$ | II: Advanced GIS |  |
| 592 |  |  |
| Psy 510 | Occupational Safety and Health | 3 |
| Psy 550 | Occupational Health Psychology | 4 |
| Psy 510 | Work and Well-Being | 3 |

## Total Credit Hours: 60

For more information and instructions on how to apply vis it the MPH in Environmental Sy stems \& Human Health web page.

## EPIDEMIOLOGY MPH

Graduates of the OHSU-PSU School of Public
Health MPH in Epidemiology work to reduce disease risk and promote health by dis covering and understanding the causes, prevention, and control of adverse health outcomes in populations. Epidemiologists are often employed by local, state, and federal government agencies; non-profit public health organizations; research institutes, and post-secondary institutions. Graduates direct studies and analyze dataas well as communicate findings to the public and policy makers.

## Program Competencies

Students graduating fromthis programwill be able to:

- Apply population-based concepts of epidemiology and risk determination to the assessment of health problems.
- Apply evidence-based knowledge of health determinants to public health is sues.
- Apply and interpret a variety of statistical methods commonly used in medical and public health research.
- Propose and test a researchhypothesis.
- Identify ethicalprinciples problems that arise in public health policy decisions.
- Apply knowledge of cultural dimensions in conducting research, including culturally sensitive recruitment of study participants, and develop strategies for interpretation of data in the larger cultural context.
- Integrate and apply relevant literature in epidemiology to public health is sues and policy.
- Communicate public health principles and concepts through various strategies across multiple sectors of the community


## PROGRAM OF STUDY

Core Required Coursework (22 Credits)
BSTA 511 Estimation and Hypothesis
$\begin{array}{lll}\text { Epi 512 } & \text { Epidemiology I } \\ \text { ESHH 511 } & \text { Concepts of Environmental }\end{array}$
Health
HSMP 574 Health Systems Organization 3
PHE 512 Principles of Health Behavior 3
Exam Certified in Public Health 0
Epi 502 Integrative Experience Paper 1
Epi 504 Practice Experience 4
Program Required Coursework ( $\mathbf{2 7}$ credits)
BSTA $512 \quad$ Linear Models
BSTA 513 Categorical Data Analysis 4
Epi 513 Epidemiology II 4
Epi 514 Epidemiology III 4
Epi $536 \quad$ EpidemiologicalData Analysis 4
\& Interpretation
Epi $566 \quad$ Current Is sues in Public Health 2
HSMP 573 Values and Ethics in Health 3
UNI 504 Qualitative Methods for Health 2

Commonly taken elective courses* ( 11 credits)
BSTA 514 Statistical Analysis of Time-toEvent Data
BSTA 515 Data Management \& Analysis in 3
SAS
BSTA 516 Design and Analysis of Surveys 3
BSTA 517 Statistical Methods in Clinical 3
BSTA 519 Applied Longitudinal Data 3
CPH 515 Geographic InformationSystems 3
CPH 521 SocialDeterminants of Health 3
Epi 505 Reading and Conference 1-3
Epi 540 Introductionto Research 3
Epi 556 HIV/AIDS Epidemiology 3
Epi 568 Infectious Disease Epidemiology 2
Epi $576 \quad$ Chronic DiseaseEpidemiology 2
Epi 630 Epidemiology Journal Club 1
HSMP581 PopulationHealth:Policy and 3
PHE 519 Introduction to the Etiology of 3
PHE 522 Health and Social Inequalities 3
PHE 532 Developmental Origins of Health 3 and Disease (DOHaD) Epidemiology
PHE 534 Social Epidemiology Methods \& 3

* Other courses may be approved by the MPHEpi

ProgramDirector.
Total Credit Hours: 60
For more information and instructions on how to apply visit the MPH in Epidemiology web page.

## HEALTH MANAGEMENT AND POLICY M.P.H.

The goal of the Health Management \& Policy programis to develop and strengthen the knowledge and practice of the delivery and management of health services. The programprepares individuals for the exercise of competent and effective policy and administrative leadership in the health sector. The Health Management \& Policy curriculumincludes the core concepts of public health with specific instruction in management, finance, strategy, policy, economics, and ethics.

## Program Competencies

Students graduating fromthis programwill be able to:

- Demonstrate effective verbal, written and interpersonal communication and messaging skills.
- Demonstrate ethical, social, and cultural competency in the practice of health management and policy.
- Engage with, and integrate the knowledge and experience of other health professions, systemstakeholders, and communities to address health systemchallenges.
- Demonstrate critical and self-reflective thinking in the practice of health management and policy.
- Apply theory to practice to design, implement, manage, and evaluate processes to improve organizational performance and health policy.
- Apply policy process knowledge and advocacy techniques to support the development and implementation of policies that advancehealth.
- Select and apply appropriate theories and qualitative and quantitative methods to analyze, evaluate, and manage health systemprograms and services.
- Demonstrate professional, collaborative, and ethical leaders hip skills to address health systemmanagement and policy is sues.


## REQUIREMENTS

Students admitted to thehealth management and policy M.P.H. degree are required to complete 62 hours of coursework. Instruction is provided at Portland State University and Oregon Health \& Science University. Students are required to pass theCertified in Public Health $(\mathrm{CPH})$ examination before graduation.
Core courses (17)
PHE 512 Principles of Health Behavior

| BSTA 525 | Introduction to Biostatistics | 4 |
| :---: | :---: | :---: |
| Epi 512 | Epidemiology I | 4 |
| ESHH 511 | Concepts of Environmental | 3 |
|  | Health |  |
| HSMP 574 | Health Systems Organization | 3 |
| Health management and policy required courses(24) |  |  |
| HSMP 541 | Organizational Behavior in | 3 |
|  | Health Service Organizations |  |
| HSMP 571 | Health Policy | 3 |
| HSMP 573 | Values and Ethics in Health | 3 |
| HSMP 576 | Strategic Management of Health Care Organizations | 3 |
| HSMP 577 | Health Care Law and Regulation | 3 |
| HSMP 586 | Introduction to Health | 3 |
|  | Economics |  |
| HSMP 587 | Financial Management of Health | 3 |
|  | Services |  |
| HSMP 588 | ProgramEvaluation and | 3 |
|  | Management In Health Services |  |
| Eective credits from the following list (15): |  |  |
| PA 525 | Grantwriting for Nonprofit | 3 |
|  | Organizations |  |
| PA 543 | Creating Collaborative | 3 |
|  | Communities |  |
| PA 545 | Organizational Development | 3 |
| PA 549 | Cross-culturalCommunication in the Public Sector | 3 |
| PA 553 | Sustainable Development Policy and Governance | 3 |
| PA 554 | Policy Analysis Research | 3 |
| PA 556 | Public Contract Management | 3 |
| PA 558 | Managing Public Projects and | 3 |
|  | Programs: From Local to Global |  |
| HSMP 544 | Leadership and Governancein | 3 |
|  | Health Services |  |
| HSMP | Health Administration | 3 |
| 570/PAH |  |  |
| 570 |  |  |
| HSMP 572 | Health Politics | 3 |
| HSMP 575 | Advanced HealthPolicy | 3 |
| HSMP 578 | Performance Improvement in | 3 |
|  | Health Services |  |
| HSMP 579 | Health Information Technology | 3 |
| HSMP 580 | and Systems Management Health Services Human | 3 |
|  | Resources Management |  |
| PHE 520 | Qualitative Research Design | 3 |
| PHE 541 | Media Advocacy and Public | 3 |
|  | Health |  |
| Age 557 | NationalLong-termCare Policy | 3 |

Other courses may be approved by the adviser.
Field work (6)
InterprofessionalEducation course

## HSMP 502 Integrative Experience and Paper 1 <br> HSMP 509 Practice Experience

## Total Credit Hours: 62

For more information and instructions on how to apply visit the MPH in Health Management \& Policy web page.

## HEALTH PROMOTION M.P.H.

The Health Promotion programis an interdisciplinary course of study providing students with specialized training in public health promotion and education. Through coursework and community-based experiences, students learn to address factors in the broader social, economic, policy, and built environments to improve the health of populations. In this track students build practice and research skills for population-level intervention, including programdevelopment, implementation, and evaluation. The curriculumfurther offers opportunities to focus on health across the lifespan. Graduates of the Health Promotion track will be able to effectively recognize and as sess health dis parities, communicate health information, promote health equity, and mobilize resources for social change.

## ProgramCompetencies

Students graduating fromth is programwill be able to:

- Apply theory in the development, implementation, and evaluation of health promotion interventions, programs, and policies.
- Develop interventions and programs to effect change at multiple levels, including individual, community, organizations, and policy.
- Design and implement strategies to promote health.
- Solicit and integrate input fromcommunity and organization stakeholders.
- Design and deliver health communication mes sages.
- Evaluate and interpretresults fromprogramevaluations and other research.
- Define research problems, frame research questions, design research procedures, and outline methods of analysis.
- Apply ethical principles that govern the practice of public health.
- Demons trate cultural competency in health promotion among all social and cultural communities.


## REQUIREMENTS

Core Courses ( 17 Credits)
PHE 512 Principles of Health Behavior

| Epi 512 | Epidemiology I | 4 |
| :---: | :---: | :---: |
| ESHH 511 | Concepts of Environmental Health | 3 |
| HSMP 574 | Health Systems Organization | 3 |
| BSTA 525 | Introductionto Biostatistics | 4 |
| Health Promotion Required Courses (34-35 Credits) |  |  |
| PHE 511 | Foundations of Public Health | 3 |
| PHE 517 | Community Organizing | 3 |
| PHE 519 | Introduction to the Etiology of Disease | 3 |
| PHE 520 | Qualitative Research Design | 3 |
| PHE 521 | Quantitative Research Design and Analysis | 3 |
| PHE 550 | Health Promotion Program Planning | 4 |
| HSMP 573 | Values and Ethics in Health | 3 |
| HSMP 588 | ProgramEvaluation and Management In Health Services | 3 |
| PHE 540 | Mass Media and Health | 3 |
|  | or |  |
| PHE 541 | Media Advocacy and Public Health | 3 |
| PHE 504 | Practice Experience | 4 |
| IPE | Interprofessional Experience | 1-2 |
| PHE 502 | Integrative Experience and Paper | 1 |

## Area of Emphasis (9 credits)

The student's academic advis or will work the student to define and must approve the Area of Emphas is.

## Total Credit Hours: 60-61

Formore information and instructions on how to apply visit the MPH in Health Promotion web page.

## MPH IN PUBLIC HEALTH PRACTICE (ONLINE)

Students in the OHSU-PSU School of Public Health MPH in Public Health Practice acquire broad knowledge about and perspectives on public health policy and practice, with particular emphasis on improving primary healthcare acces sibility and quality for underserved populations based on the concepts and principles of primary health care defined by the World Health Organization (universal coverage, service delivery, public policy, leadership, and stakeholder participation). To support working and distance students, coursework for the MPH in Public Health Practice programmay be completed entirely online. Online MPH students are fully matriculated into the School of Public Health and have the option to complete some of their courses in person. Graduates are employed by state and local governmental agencies, non-profits, and community organizations.

## Program Competencies

Students graduating fromthis programwill be able to:

- Assess, analyze and synthesize the health status of vulnerable populations
- Identify, develop and manage interventions to promote and protect the health of populations at risk
- Lead and participate in interprofessional efforts to address health inequities with community partners
- Conduct, participate in or apply research which improves the health of a population
- Assess and integrate cultural beliefs and practices into public health interventions
- Develop \& apply effective communication strategies across multiple sectors of the community
- Apply programplanning and quality improvement principles in the development, management and/or evaluation of population health services.
- Demonstrate basic skills in development of a grant proposal.
- Employ techniques to manage human, fiscal, and other public health resource
CORE REQUIRED COURSEWORK (22 CREDITS)

| BSTA 525 | Introduction to Biostatistics | 4 |
| :--- | :--- | :--- |
| Epi 512 | Epidemiology I | 4 |
| ESHH 511 | Concepts of Environmental | 3 |
|  | Health |  |
| HSMP 574 | Health Systems Organization | 3 |
| PHE 512 | Principles of Health Behavior | 3 |
| Exam | Certified in Public Health | 0 |
|  | Examination |  |
| CPH 502 | Integrative Experience and Paper | 1 |
| CPH 509A | Practice Experience | 4 |

## PROGRAM REQUIRED COURSES (25 CREDITS)

Interprofessional Education course

CPH 511 Research Methods and Evidencebased Practice
or
PHE 520
Qualitative Research Design
CPH 521
SocialDeterminants of Health

| CPH 522 | Communicating Public Health <br> Data <br> Management Practice and <br> CPH 528 <br> Quality Improvement in Health <br> Care and Public Health <br> Organizations | 3 |
| :--- | :--- | ---: |
| CPH 535 536 |  <br> Systems Thinking in Public | Health <br> Community Based Participatory <br> Research |
| CPH 538 | Public Health Program <br> Evaluation <br> or <br> ProgramEvaluation and <br> Management In Health Services | 3 |
| CPH 550 588 | Public Health ProgramPlanning | 3 |

## ELECTIVE COURSES (9 CREDITS)

Electives Recommended for Online Students

| CPH 507A | Current Is sues in Public Health <br> Geographic Information Sy stems | 3 |
| :--- | :--- | :--- |
| CPH 523 | for Public Health <br> Primary Health Care and Health <br> Disparities: GlobalPerspectives <br> and ProgramDevelopment | 3 |
| CPH 526 |  <br> Chronic Disease | 3 |
| CPH 531 | Social Context of Public Health <br> Policy | 3 |
| HSMP 579 | Health Information Technology <br> and Systems Management | 3 |
| PHE 545 | Men's Health | 4 |
| PHE 553 | Women's ReproductiveHealth | 4 |

## Total Credit Hours: 56

For more information and instructions on how to apply visit the MPH in Public Health Practice (online) web page.

## BIOSTATISTICS MS

The Master of Science in Biostatistics degree is designed to provide graduate level training in the application and theory of biostatistics. The programis primarily aimed at those wishing to pursue careers as intermediate level biostatisticians or apply for doctoral programs in Biostatistics. The programis also appropriate for individuals who have earned a Graduate Certificate in Biostatistics and wish to pursuefurther training.

Target audiences for this programinclude individuals who des ire careers as collaborativebiostatisticians in the basic,
clinical, trans lational or population sciences. The program will also be appropriate for some clinical and translational researchers (e.g.K awardees or postdoctoral trainees), students in other Oregon graduate programs, as well as working profes sionals throughout the state and region (e.g. public health practitioners, laboratory scientists, data managers, database programmers, other research professionals).

All faculty members in the Department's Division of Biostatistics are actively involved with externally funded projects. Students will have opportunities to work with real world applications under the supervision of faculty.

## Program Competencies

Students graduating fromthis programwill be able to:

- Apply intermediate to advanced biostatistical theory and techniques to design, plan, and manage data collection to conduct analy sis for own research projects or support collaborative research teams
- Trans late broad research goals into specifications and procedures forstatistical analy sis and interpretation of results in basic, clinical, translational and public health research studies
- Select and use appropriate statistical analysis software for as sessment, decision-making and informationsharing (e.g., Stata, SAS, R or other special programs)
- Communicate statistical methods and findings clearly and unambiguously to specialists and non-specialist audiences

| Required Coursework (40 credits) |  |  |
| :--- | :--- | ---: |
| BSTA 511 | Estimation and Hypothesis <br>  <br>  <br> Testing for Applied Biostatistics | 4 |
| BSTA 512 | Linear Models | 4 |
| BSTA 513 | CategoricalData Analysis | 4 |
| BSTA 514 | Statistical Analysis of Time-to- | 3 |
|  | Event Data |  |
| BSTA 517 | StatisticalMethods in Clinical | 3 |
|  | Trials |  |
| BSTA 519 | Applied Longitudinal Data | 3 |
|  | Annalysis |  |
| BSTA 530 | Biostatistics Lab | 3 |
| BSTA 550 | Intro to Probability | 3 |
| BSTA 551 | Statistical Inference I | 3 |
| BSTA 552 | Statistical Inference II | 3 |
| Epi 512 | Epidemiology I | 4 |
| PHE 513 | Introductionto Public Health | 3 |
|  | Comprehensive Examination: | $0 ;$ |
|  | Written section | Pass |


|  | Comprehensive Examination: Lab section | $\begin{array}{r} 0 \\ \text { Pass } \end{array}$ |
| :---: | :---: | :---: |
| Eective Coursework (14 credits) |  |  |
| Bsta 500 | Reading and Researchin Biostatistics | 1-3 |
| BMI 550 | ComputationalBiology I | 4 |
| BMI 551 | ComputationalBiology II | 4 |
| BSTA 515 | Data Management \& Analysis in SAS | 3 |
| BSTA 516 | Design and Analysis of Surveys | 3 |
| BSTA 521 | Bayesian Methods for Data Analysis | 3 |
| BSTA 522 | Statistical Learning and Data Science | 3 |
| BSTA 523 | Design and Analysis of Experimental Designs | 3 |
| BSTA 524 | Statistical Methods for Next Gen Sequencing | 3 |
| Epi 513 | Epidemiology II | 4 |
| Stat 567 | Applied Probability I | 3 |
| Stat 568 | Applied Probability II | 3 |
| Stat 580 | Nonparametric Methods | 3 |

Other courses may be may be used as electives with approval fromthe ProgramDirector.

## Total Credit Hours: 54

For more information and instruction on how to apply visit the MS in Biostatistics web page.

## Graduate Certificates

BIOSTATISTICS GRADUATE CERTIFICATE
The Graduate Certificate in Biostatistics programwill provide basic and intermediate graduate level biostatistics training for a diverse rangeof students in the health sciences. It is primarily aimed at researchers, students in other programs, and working professionals who are interested in becoming more skilled in applied biostatistics methods and theory. Many students have also chosen the graduate certificate program to start learning biostatistics prior to applying to the MS in Biostatistics program.

Candidates should possess an aptitude for mathematics. Thirty credits ( 18 credits in core courses, 12 in electives) will be required to earn the Certificate in Biostatistics. The programis comprised of formal didactic sessions and hands-on statistical computing. Clas sroom and laboratory training will include ample contextualized examples, and analys is projects using real life data. Opportunities exist for mentored collaborative health science research experiences involving ongoing projects with our faculty.

## Core Competencies

Students graduating fromthis programwill be able to:

- Perform a broad rangeofbasic and intermediatelevel applied statistical procedures that are required in basic, clinical, population and translational sciences
- Interpret and summarize analys is results in research reports and papers and communicate themto individuals with varying degrees of statistical knowledge
- Apply the principles of research design to address problems in basic, clinical, and population sciences
- Identify strengths and weaknesses of alternative designs and analytic methods
- Conduct analyses for the student's own research projects or provide support to collaborative research teams


## CORE REQUIREMENTS

| BSTA 511 | Estimation and Hypothesis <br> Testing for Applied Biostatistics | 4 |
| :--- | :--- | :--- |
| BSTA 512 | Linear Models | 4 |
| BSTA 513 | Categorical Data Analysis | 4 |
| BSTA 530 | Biostatistics Lab | 3 |

Subtotal: 15

## ELECTIVE COURSEWORK

| BSTA 514 | Statistical Analy sis of Time-toEvent Data | 3 |
| :---: | :---: | :---: |
| BSTA 515 | Data Management \& Analysis in SAS | 3 |
| BSTA 516 | Design and Analysis of Surveys | 3 |
| BSTA 517 | Statistical Methods in Clinical Trials | 3 |
| BSTA 519 | Applied Longitudinal Data Analysis | 3 |
| BSTA 522 | Statistical Learning and Data Science | 3 |
| BSTA 523 | Design and Analysis of Experimental Designs | 3 |
| BSTA 524 | Statistical Methods for Next Gen Sequencing | 3 |
| Epi 512 | Epidemiology I | 4 |
| Epi 513 | Epidemiology II | 4 |
| BMI 550 | Computational Biology I | 4 |
| BMI 551 | Computational Biology II | 4 |
| Bsta 500 | Reading and Research in Biostatistics | 1-3 |

## Total Credit Hours: 24

Students in the Graduate Certificate may apply to the MS or MPH in Biostatistics programif they wish to pursue more training in Biostatistics beyond the Graduate Certificate. They may apply while going through, or after completing the graduate certificate program. All credits earned in the certificate programmay be applied to the MS degree, or, most credits as appropriate, to the MPH degree.
For more information and instructions on how to apply visit the Certificate in Biostatistics web page.

## PUBLIC HEALTH GRADUATE CERTIFICATE

The Graduate Certificate in Public Health (GCPH) is an online program designed to enhance the preparation of public health professionals not currently prepared in a public health academic specialty, and provide a broad introduction to public health for students. The GCPH is open to applicants with a bachelor's degree in any discipline.

There is an identified urgent and ongoing need for suitable public health preparation in the current workforce. The GCPH will provide you an exceptional foundation that will enhance your marketable public health expertise, improve your professional flexibility and mobility, and provide core public health competencies.

## ProgramCompetencies

Students graduating fromthis programwill be able to: -

Use principles of statistical inferenceforcritical reading and interpretation of reports of statistical analysis and of public health problems;

- Apply epidemiologic methods to identify patterns of disease and injury;
- Analyze the environmental and occupational impacts on the health of a population;
- Identify and analyze major is sues in health services and systems associated with the delivery, quality and costs of health care;
- Communicate theoretical principles, constructs, and models used to understand and affect the behavioral aspects of health.

For more information and instructions on how to apply visit the Certificate in Public Health web page.

## Undergraduate Programs

The OHSU-PSU School of Public Health's multidisciplinary undergraduate programs provide students
with the opportunity to customize a focus of study and to create a trajectory toward careers of interestin the health field.

Undergraduate degrees in the School of Public Health are offered in Public Health Studies and in Applied Health \& Fitness. The Public Health Studies curriculumis designed around a common core and five specialized concentrations: healthy aging, community health promotion, pre-clinical health science, school health educator, and health services administration.

The Applied Health \& Fitnes s degreehas 3 specialized focus areas: fitness \& exercise, fitness for special populations, and health coaching.

DEGREE MAPS, LEARNING OUTCOMES, AND GRADE REQUIREMENTS

To view the degree maps andexpected learning outcomes for the School of Public Health's undergraduate degrees, go to www.pdx.edu/academic-programs/a-z.
A grade of C - or better is mandatory in all coursework required for degrees in the School of Public Health. With the exception of internship credits, courses taken under the undifferentiated grading option (pass/nopass) will not be accepted toward fulfilling the majors or minors offered within the School. Students must fulfill all general University requirements in addition to specific school requirements.

## ADMISSION REQUIREMENTS

Admission to the department is based on general admis sion to the University. See Admis sions Requirements (p. 8) for more information.

APPLIED HEALTH \& FITNESS B.A./B.S.

## REQUIREMENTS

## Required Coursework

In the BA/BS in Applied Health and Fitness students will explore and apply the most current research and science in the field of exercise, physical activity, and health. With three specialized focus areas (Fitness and Exercise, Health Coaching, andFitness for Special Populations), your coursework includes a core foundation in public health and specialized skills in exercise science.
In addition to meeting the general University degree requirements all majors in Applied Health \& Fitness must take the following required coursework. Majors must also complete coursework in one of three focus areas: Fitness \& Exercise, Fitness for Special Populations, or Health Coaching.
PHE 250
Our Community: Our Health
4

| PHE 270 | Basic Biomechanics | 2 |
| :--- | :--- | ---: |
| PHE 314 | Research in Health and Fitness | 4 |
| PHE 325U | Nutrition for Health | 4 |
| PHE 363 | Communicable Diseases and | 4 |
|  | Chronic Health Problems |  |
| PHE 370 | Applied Kinesiology | 4 |
| PHE 473 | Physiology of Exercise | 4 |
| PHE 474 | Exercise Prescription and | 4 |
|  | Training |  |
| PHE 475 | Exercise Testing Techniques | 4 |
| PHE 404 | Cooperative Education/Intemship | $4-8$ |
| Bi 301 | Human Anatomy and Physiology | 4 |
| Bi 302 | Human Anatomy and Physiology | 4 |

Subtotal: 46-50

## FITNESS \& EXERCISE FOCUS

| Required Courses |  |  |
| :--- | :--- | :--- |
| PHE 324 | Health Coaching Foundations | 4 |
| PHE 421 | Health Coaching Strategies | 4 |
| PHE 456 | Health Aspects of Aging | 4 |
| PE 194 | Fitness Instruction: Personal | 2 |
|  | Training |  |
| BA | Courses Upon Advisor Approval | 4 |
|  | PHE or approved electives | 8 |
|  | Students earning a PEteaching |  |
|  | endorsement for Secondary |  |
|  | Education see*** below. |  |

Subtotal: 26
*** Students take the following 4-credit courses for the teaching endorsement:
PHE 340 - MotorLearning
PHE 417 - Adapted Physical Education
Psy 311U - Human Development

FITNESS FOR SPECIAL POPULATIONS FOCUS

| Required Courses |  |  |
| :--- | :--- | :--- |
| PHE 295 | Health Promotion/Disease | 4 |
| PHE 340 | Prevention <br> Motor Learning <br> PHE 417 | Adapted Physical Education |
| PHE 456 | Health Aspects of Aging <br> or | 4 |
| Psy 311U | Human Development | 4 |
| PE 193 | Fitness Instruction: Adapted <br> Physical Education <br> PHE or approved electives | 4 |

Subtotal: 26

## HEALTH COACHING FOCUS

| Required Courses |  |  |
| :--- | :--- | :--- |
| PHE 295 | Health Promotion/Disease | 4 |
| PHE 324 | Prevention <br> Health Coaching Foundations | 4 |
| PHE 323U | Health Coaching Strategies | 4 |
| PHE 466 | Intro to Fat Studies <br> or <br> Mind/Body Health: Disease <br> Prevention | 4 |
|  | PHE orapprovedelectives | 4 |

## HUMAN LACTATION CERTIFICATE

The Human Lactation Certificate offers comprehensive lactation training for:

- Non-health professionals who want to become certified as International Board Certified Lactation Consultants (IBCLC).
- Health professionals who want to become certified as International Board Certified Lactation Consultants (IBCLC).
- Students wishing to seek a bachelor's degree in Clinical Health Sciences with an emphasis on lactation education and professional lactation consultant training.
- Students interested in politics, policy and research from the perspective of improving maternal and infant health outcomes.

Completion of the Lactation Pathway enables students to sit for the International Board Certified Lactation Consultant(IBCLC) exam. IBCLC designation enables students to provide advanced practiceclinical lactation care for families in a variety of settings.

## REQUIREMENTS

| PHE 418 | Lactation Education 1: <br> Introduction to Human Lactation | 4 |
| :--- | :--- | ---: |
| PHE 419 | Lactation Education 2: Advanced | 4 |
| PHE 420 | Lactation Care <br> Lactation Education 3: Clinical <br> Considerations in Lactation | 2 |
| PHE 409 | Practicum | 15 |

## Total CreditHours: 25

For more information about the Human Lactation Certificate, please visit:https://ohsu-psusph.org/undergraduate/lactation/.

## PUBLIC HEALTH STUDIES B.A./B.S.

## REQUIREMENTS

## Core requirements

In addition to meeting the general University degree requirements all majors in health studies must take the following core coursework plus choose a concentration area:

## Core coursework

| PHE 250 | Our Community: Our Health | 4 |
| :--- | :--- | ---: |
| PHE 350 | Health and Health Systems | 4 |
| PHE 363 | Communicable Diseases and | 4 |
|  | Chronic Health Problems |  |
| PHE 404 | Cooperative Education/Intemship | $4-8$ |
| PHE 450 | Epidemiology | 4 |
| PHE 452U | Gender, Race, Class and Health | 4 |
| Stat 243 | Introduction to Probability and | 4 |
|  | Statistics I |  |

## HEALTHY AGING CONCENTRATION

In the Healthy Aging concentration, students will learn about the societal, community, and individual-level strategies needed to support our aging population. Students will build foundations in gerontology while also acquiring skills in administration and finance, prevention of chronic disease, and health promotion programming, which will position students to enter careers as assisted living or nursing home facilities adminis trators, long-termcare coordinators, health promotion programimplementers, or senior health promotion specialists.
In addition to the previously lis ted common core requirements, students pursuing a concentration in aging services must complete the following:
Required cours ework ( $\mathbf{2 8}$ credits)

| PHE 325U | Nutrition for Health | 4 |
| :---: | :---: | :---: |
| PHE 354U | SocialGerontology | 4 |
| PHE 416 | Families and Aging | 4 |
| PHE 423 | Business and Aging | 4 |
| PHE 456 | Health Aspects of Aging | 4 |
| PHE 478 | ProgramPlanning and Evaluation: Needs Assessment and Interventions | 4 |
| PHE 479 | ProgramPlanning and Evaluation in Health Education: Implementation andEvaluation | 4 |
| Choose one of the following: |  |  |
| PHE 328U | Health and Housing Across the Life Course | 4 |
| PHE 369 | Public Health Law, Policy, and Ethics | 4 |
| Psy 462 | Psychology of Adult | 4 |
|  | Development and Aging |  |
| Soc 469 | Sociology of Aging | 4 |


| Choose one of the following: |  |  |
| :---: | :---: | :---: |
| BA 306U | Essentials of FinanceforNonBusiness Majors | 4 |
| BA 316U | Essentials of Marketing for NonBusiness Majors | 4 |
| BA 326U | Essentials of Management for Non-Business Majors | 4 |
| 16 credits from the following courses |  |  |
| BA 101 | Introduction to Business and World Affairs | 4 |
| BA 306U | Essentials of Finance forNonBusiness Majors | 4 |
| BA 316U | Essentials of Marketing for NonBusiness Majors | 4 |
| BA 326U | Essentials of Management for Non-Business Majors | 4 |
| BA 336U | Essentials of Information Technology for Non-Business Majors | 4 |
| BA 346U | Essentials of Entrepreneurship for Non-Business Majors | 4 |
| 318 U |  |  |
| Ec 316U | Introduction to Health Care Economics | 4 |
| PHE 328U | Health and Housing Across the Life Course | 4 |
| PHE 369 | Public Health Law, Policy, and Ethics | 4 |
| PHE 445 | Men's Health | 4 |
| PHE 446U | Health Equity and Social Justice | 4 |
| PHE 451 | Women and Holistic Health | 4 |
| Phl 313U | Life and Death Issues | 4 |
| Psy 311U | Human Development | 4 |
| Psy 462 | Psychology of Adult | 4 |
|  | Developmentand Aging |  |
| Soc 459 | Sociology of Health and | 4 |
|  | Medicine |  |
| Soc 469 | Sociology of Aging | 4 |
| SW 301U | Introduction to Social Work | 4 |
| PHE 320U | Health Ethics: Contemporary Issues | 4 |

Otherelectives may be taken with advisor approval.

## COMMUNITY HEALTH PROMOTION CONCENTRATION

Students pursuing the Community Health Promotion concentration will learn the societal, community, and individual-level factors that createrisk -- or promote good health -- in populations. In particular, students will build skills to identify and address health disparities across populations, define health problems, and learn to design and implement strategies to promote health in the larger community.

In addition to the previously listed common core requirements, students pursuing a concentration in community health promotion must complete:

## Required cours ework ( 24 credits)

| PHE 369 | Public Health Law, Policy, and <br> Ethics |
| :--- | :--- |
| PHE 443U | Environmental Health |
| PHE 444U | Global Health |
| PHE 472 | Marketing Public Health <br> PHE 478 |
|  | ProgramPlanning and <br> Evaluation: Needs Assessment <br> and Interventions |
| PHE 479 | ProgramPlanning and <br>  <br>  <br> Evaluation in Health Education: <br> Implementation and Evaluation |

Twenty (20) credits from the following courses:

| PHE 275 Stress Management |  |
| :--- | :--- |
| PHE 325U | Nutrition forHealth |

PHE 325U Nutrition forHealth 4
PHE 326U Drug Education 4
PHE 335U Human Sexuality 4
PHE 351U Film and Health 4
PHE 355U Consumer Health Issues 4
PHE 361 Care and Prevention of Injuries 4
PHE 365 Health Promotion Programs for 4
Children and Youth
PHE $445 \quad$ Men's Health 4
PHE 446U Health Equity and Social Justice 4
PHE 448 Health Education Techniques 4
and Strategies
PHE $451 \quad$ Women and Holistic Health 4
PHE 453 Women's ReproductiveHealth 4
PHE 456 Health Aspects of Aging 4
PHE 466 Mind/Body Health:Disease 4
Prevention
PHE 467 Mind/Body Health:Human 4
Potential
Controversial Is sues in 4
Community Health
PHE 320U Health Ethics: Contemporary Issues

Other electives may be taken with adv isor approval.

## HEALTH SERVICES ADMINISTRATION CONCENTRATION

The health services adminis tration concentration is designed for individuals who wish to develop or enhance a career in health systems administration, including such activities as health programmanagement, health policy analys is, patient support, health finance, quality improvement, and other administrative functions.
Students who complete the course work required for the concentration will possess a basic understanding of health systems with particular knowledge and skills in
administration and finance, health policy, and health systems.

The programof study includes common core requirements, required courses, and elective course options. Students pursuing a concentration in health services adminis tration must complete the following:

| Required Courses (44 credits) |  |  |
| :---: | :---: | :---: |
| BA 101 | Introduction to Business and World Affairs | 4 |
| BA 306U | Essentials of Finance forNonBusiness Majors | 4 |
| Ec 316U | Introduction to Health Care Economics | 4 |
| PA 425 | Grantwriting for Nonprofit Organizations | 4 |
| PHE 320U | Health Ethics: Contemporary Issues | 4 |
| PHE 321U | Introduction to Health Policy | 4 |
| PHE 322U | Health Services Administration | 4 |
| PHE 426 | Advanced Topics in Health Services Administration | 4 |
| PHE 427 | Introduction to Health Informatics | 4 |
| PHE 478 | ProgramPlanning and Evaluation: Needs Assessment and Interventions | 4 |
| PHE 479 | ProgramPlanning and Evaluation in Health Education: Implementation and Evaluation | 4 |
| Elective Courses (8) |  |  |
| Two electives fromthe following: |  |  |
| Comm | Introduction to Health | 4 |
| 329 U | Communication |  |
| PA 315U | Managing People for Change | 4 |
| PA 320U | Introduction to Nonprofit Management | 4 |
| PA 399 | SpecialStudies | 1-4 |
| PHE 354U | Social Gerontology | 4 |
| PHE 423 | Business and Aging | 4 |
| PHE 472 | Marketing Public Health | 4 |

Otherelectives may be taken with adv isor approval.
INDIGENOUS HEALTH CONCENTRATION
To acknowledge the rich cultural his tories and resilience of Indigenous peoples in the places that are home to the present-day universities of Oregon Health Sciences University and Portland State University, the Indigenous health concentration will emerge from-and be supported by-an Indigenous and decolonizing and healing-justice praxis that draws on the strengths of Indigenous peoples and other communities of color that have been his torically underserved and oppressed by white supremacy and colonialis $m$. This new concentration is designed to support
and strengthen Indigenous sovereignty and selfdetermination of Native peoples, and build a network of non-Native allyship for a healing-centered justice movement to emerge and sustain health equity for all.
In addition to the previously lis ted common core requirements, students pursuing a concentration in Indigenous Health must complete:

| Required Cours ework (36 credits) |  |
| :---: | :---: |
| NAS 201 | Introduction to Native American |
|  | Studies |
| NAS 392 | Indigenous Ways of Knowing |
| NAS 399 | Cultural Ecology \& Indigenous |
|  | Science |
| NAS 426 | Tribal Critical Race Theory |
| NAS 442 | Decolonizing Methodologies: |
|  | Insurgent Research and |
|  | Indigenous Education |
| PHE 215 | Why Public Health Needs |
|  | Indigenous Values: Intro to |
|  | Decolonizing Public Health |
| PHE 415 | Native American Health: |
|  | Decolonizing Health Equity |
| PHE 478 | ProgramPlanning and |
|  | Evaluation: Needs Assessment and Interventions |
| PHE 479 | ProgramPlanning and |
|  | Evaluation in Health Education: |
|  | Implementation and Evaluation |

NAS 404 may be substituted for PHE404 Internship in the core requirements.

## 16 credits from the following courses:

| NAS 342 | Indigenous Gardens and Food <br> Justice | 4 |
| :--- | :--- | :--- |
| NAS 407 | Traditional Ecological Healing | 4 |
| NAS 411 | Practices <br> Nationhood: Tribal Sovereignty, <br> Governance \& Policy | 4 |
| PHE 315 | Justice in Public Health: The <br> Epidemic of Missing and | 4 |
|  |  |  |
| SW 340 | Peoples <br> Advocacy for Policy Change | 4 |
| SW 341 | Social Justice Practice | 4 |
| SW 339 | Introductionto Oppression and | 4 |
| WS 381 | Privilege <br> Queer of Color Theorizing and | 4 |
| WS 451 | Perspectives <br> Interrupting Oppression | 4 |

Other electives may be taken with advisor approval.

## PRE-CLINICAL HEALTH SCIENCE CONCENTRATION

The Pre-Clinical Health Science concentration prepares students for continued clinical study in one of the many licensed health professions. Students will gain a foundation in public health while also completing prerequisites for their chosen clinical path, including medicine, nursing, physical therapy, occupational therapy, pharmacy, dentistry, dental hy gienics, ophthalmology, and others.
In addition to the previously listedcommon core requirements, students pursuing a concentration in health sciences must select one of the following options: pre-medicine, pre-dentistry, pre-physical therapy, preoccupational therapy, pre-chiropractic medicine, preosteopathy, pre-podiatry, pre-nursing, pre-naturopathic medicine, pre-optometry, pre-pharmacy, and pre-physician assistant and pre-physician assistant or adviser approved option. In choosing courses to complete, students should verify the specific prerequisites required by the profes sional school(s) to which an application for admis sion is being submitted. Advis ing sheets summarizing prerequis ites for professional schools in Oreg on and selected schools in the Pacific Northwest can be found online at $h t t p: / / w w w . p d x . e d u / c l a s / p r e p r o . h t m l . ~$ Students must complete all prerequisites requiredby the professional school to which an application is being submitted to receive a Health Science degree. Please consult regularly with your pre-health adviser.
In addition to the previously listed core courses, students must als o complete 16 credits fromthe following upperdivision courses:

16 credits from the following upper-division courses:

| PHE 325U | Nutrition for Health | 4 |
| :--- | :--- | ---: |
| PHE 351U | Film and Health | 4 |
| PHE 354U | Social Gerontology | 4 |
| PHE 355U | Consumer Health Is sues | 4 |
| PHE 361 | Care and Prevention of Injuries | 4 |
| PHE 365 | Health Promotion Programs for | 4 |
|  | Children and Youth |  |
| PHE 370 | Applied Kinesiology | 4 |
| PHE 410 | Selected Topics | $1-8$ |
| PHE 444U | Global Health | 4 |
| PHE 445 | Men's Health | 4 |
| PHE 446U | Health Equity and Social Justice | 4 |
| PHE 451 | Women and Holistic Health | 4 |
| PHE 453 | Women's ReproductiveHealth | 4 |
| PHE 456 | Health Aspects of Aging | 4 |
| PHE 466 | Mind/Body Health: Disease | 4 |
| PHE 467 | Prevention |  |
| Mind/Body Health: Human | 4 |  |
| PHE 473 | Potential |  |
|  | Physiology of Exercise | 4 |

PHE 474

PHE 475
PHE 320U

Exercise Prescription and
Training
Exercise Testing Techniques
Health Ethics: Contemporary Issues

Other electives may be taken with advisor approval.

## SCHOOL HEALTH EDUCATOR CONCENTRATION

The School Health Educator concentration is a prelicensure program, preparing students according to state guidelines for"best practices" in school health education. School health educators teach in middle school and high school settings covering a variety of topics from safety to preventive health behaviors and decision-making. Upon completion of the bachelor degree (BA/BS), students will be eligible to apply to the fifth-year Graduate Teacher Education Programor the Secondary Dual Education Programin the Graduate Schoolof Education at PSU.

In addition to the previously lis ted common core requirements, students pursuing a concentration in school health education must complete the following:

| Required coursework (36 credits) |  |  |
| :--- | :--- | ---: |
| PHE 275 | Stres Management | 4 |
| PHE 295 | Health Promotion/Disease <br> Prevention | 4 |
| PHE 325U | Nutrition for Health | 4 |
| PHE 326U | Drug Education | 4 |
| PHE 335U | Human Sexuality | 4 |
| PHE 365 | Health Promotion Programs for | 4 |
|  | Children and Youth |  |
| PHE 448 | Health EducationTechniques and | 4 |
| Psy 311U | Strategies | Human Development |
| Ed 420 | Introductionto Education and | 4 |
|  | Society | 4 |

It is required that students who intend to apply to the GTEP programcomplete an anatomy/physiology sequence.
8 Credits of electives from the following list:
CFS 390U Sex and the Family 4

CI 432 Computer Applications for the 3
Psy 346 Learning 4
Soc 337U Prejudice, Privilege, and Power 4
SpEd 418 Survey of Exceptional Learners 3
PHE Elective Classes as
approved by advis or
Women's Studies courses on Violence and Sexuality

AGING SERVICES MINOR

The minor in aging services includes coursework that will introduce the student to basic understanding of gerontology along with particular skills in administration and finance, chronic disease, and health promotion. This programalso will enhance the skills of students planning to enroll in industry-provided training to become administrators of assisted living facilities and residential care facilities or nursing homes.

## REQUIREMENTS

To earn a minor in aging services, students must complete at least 28 credits. At least 16 credits must be taken in residence at PSU and 16 credits must be upper division. The requirements for this minor include:

| PHE 354U | SocialGerontology | 4 |
| :---: | :---: | :---: |
| PHE 456 | Health Aspects of Aging | 4 |
| Two of the following: |  |  |
| PHE 328U | Health and Housing Across the Life Course | 4 |
| PHE 416 | Families and Aging | 4 |
| PHE 423 | Business and Aging | 4 |
| 12 Credits from the following courses: |  |  |
| PHE 250 | Our Community: Our Health | 4 |
| PHE 295 | Health Promotion/Disease | 4 |
|  | Prevention |  |
| PHE 325U | Nutrition forHealth | 4 |
| PHE 328U | Health and Housing Across the Life Course | 4 |
| PHE 350 | Health and Health Systems | 4 |
| PHE 363 | Communicable Diseases and Chronic Health Problems | 4 |
| PHE 369 | Public Health Law, Policy, and Ethics | 4 |
| PHE 370 | Applied Kinesiology | 4 |
| PHE 416 | Families and Aging | 4 |
| PHE 444U | Global Health | 4 |
| PHE 445 | Men's Health | 4 |
| PHE 446U | Health Equity and Social Justice | 4 |
| PHE 450 | Epidemiology | 4 |
| PHE 451 | W omen and Holistic Health | 4 |
| PHE 473 | Physiology of Exercise | 4 |
| PHE 320U | Health Ethics: Contemporary Issues | 4 |

Otherelectives may be taken with adv isor approval. Subtotal: 28

COMMUNITY HEALTH MINOR
The minor in community health consists of coursework selected from the list of core coursework and provides students with a foundation of theory and content related to community health.

Students pursuing a Bachelors degree in any of the Public Health Studies concentrations are not eligible for a minor in Community Health.

## REQUIREMENTS

To earn a minor in community health, students must complete at least 28 credits. At least 16 credits mustbe taken in residence at PSU, and 16 credits must be upperdivision. The requirement for the minor includes:

## Courses

| PHE 250 | Our Community: Our Health | 4 |
| :--- | :--- | :--- |
| PHE 350 | Health and Health Systems | 4 |
| PHE 363 | Communicable Diseases and | 4 |
|  | Chronic Health Problems |  |
| PHE 450 | Epidemiology | 4 |
| PHE 452U | Gender, Race, Class and Health | 4 |
|  | PHE or approved electives | 8 |

Other electives may be taken with advisor approval. Subtotal: 28

## HEALTH STUDIES SECONDARY EDUCATION PROGRAM

Students who wish to become licensed teachers in health education mustcomplete a required list of courses or their equivalent before apply ing to the Graduate School of Education foradmission into the Graduate Teacher Education Program(see requirements). These courses are required whether the applicantholds a degree in the field or holds a degree in another subject field. Courses in the School can be taken to complete the Oregon Continuing Teaching License in Health, and selected courses can be taken to complete the Oregon Continuing Teaching License in Physical Education.
All courses taken for the teaching field requirement must be pas sed with a C - or better grade and must average a 3.00 GPA. Prospective teachers should contact undergraduate advisors in the School of Public Health for specific requirements.

## RESEARCH CENTERS AND INSTITUTES

## Center for Public He alth Studies

450 Urban Center
The Center for Public Health Studies (CPHS) seeks to enhance the public's health by conducting interdisciplinary research exploring the interaction of health, society, and social policy. Our goals include:

- assessing the structural causes and consequences of health and disease;
- examining health behaviors in their social context;
- studying the effects of culture and the environment on ourhealth and attitudes toward health care; and
- analyzing the political processes and social policies that affect the health status of populations.


# SCHOOL OF SOCIAL WORK 

Jose Coll, Dean
Stephanie Brys on, Associate Dean for Academic Affairs
E. Roberto Orellana, Associate Dean for Research and Spons ored Projects
Mary Oschwald, Director of Regional Research Institute for Human Services
Katharine Cahn, Assistant Dean for Continuing Education
600 Academic \& Student Recreation Center, 1800 SW
SIXTH, 503-725-4712
www.pdx.edu/social-work/

- B.A., B.S.-Child, Youth, and Family Studies
- B.A., B.S. -Social Work
- M.S.W.
- Ph.D.

The School of Social Work was establis hed at Portland State University in 1961 by a resolution of the Oreg on Legis lature. The school is committed to the enhancement of the individual and society. Further values and beliefs include a dedication to social change and to the attainment of social justice for all peoples, the eradication of poverty, the empowerment of oppressed peoples, the right of all individuals and groups to determine their own destinies, and the opportunity to live in harmony and cooperation. While the School maintains a special commitment to these values, it recognizes the need for joining with others in society who are working toward this same purpose.
Consistent with the goals of Portland State University the three major functions of the School are teaching, research, and community service. Teaching is directed to ward preparing effective and creative graduates who are ethical and culturally responsive. Students learn to serve individuals and families directly, evaluate practice, develop and administer programs, org anize neighborhoods and communities, analyze social policies, conduct research, and initiate necessary reforms of existing practice, programs, and policies. Research and scholarship focus on understanding, preventing, and ameliorating social problems. Community service involves collaborative efforts with individuals and organizations to develop innovations in social welfare services and policies.
The School has an educational programinvolving eight structural components: the Child and Family Studies (CFS) program; the Baccalaureate Social Work (B.S.W.) program; the Master of Social Work (M.S.W.) program; the Distance M.S.W. Option; the Online M.S.W Option; the Ph.D. in Social Work and Social Research program; the Center for Improvement of Child and Family Services; and the Regional Research Institute forHuman Services.

## Child and Family Studies

600 Academic and Student
Recreation Center
1800 SW Sixth Avenue
503-725-8241
www.pdx.edu/social-work/cyfs-child-youth-and-familystudies

The Child and Family Studies Programis forstudents who have varied professional goals related to working with children, youth, and their families. Students who are interested in becoming elementary school teachers, social workers, counselors, early childhood educators, or special educators are advised to consider a degree in Child, Youth, and Family Studies (CYFS). The degree is also appropriate for students seeking career pathways such as parent educators, family advocates, youth workers, social service caseworkers, programdirectors/administrators, and clas sroom as sistants. Students gain an interdisciplinary pers pective on children, youth, and families, a broad understanding of family systems, and a working knowledge of the diverse socio-cultural contexts in which children and families develop.
The Child, and Family Studies major programcontent integrates theory with practice. A liberal arts foundation, coursework in professional development and the application of content knowledge, practicumexperiences in two diverse settings, and professional documentation prepare students for professional roles as well as graduate school. Students may choose focused elective courses in early childhoodeducation, youth work, family life education, elementary education, human services, or child life.

The Child and Family Studies programalso offers a minor, which can be completed in close alignment with the Families and Society Junior Cluster.

Both the Child, Youth, and Family Studies major and minor place strong emphasis is placed on preparing students to become change agents, creating a more just world for children, youth, and families.
Both the CYFS major and CYFS minor can be completed online, through careful planning with an advisor.

## DEGREE MAPS AND LEARNING OUTCOMES

To view the Child, Youth, and Family Studies degreemap and expected learning outcomes, go to
www.pdx.edu/academic-programs/a-z.

## ADMISSION REQUIREMENTS

Students must be admitted into the major to earn a baccalaureate degree in Child, Youth, and Family Studies. Admittance requirements are the completion of 90 credits, Ed 420, and Psy 311 U or Psy 460 or their equivalents. Once these prerequisites have been met, students submit their intention to pursue the major and are formally admitted. Information meetings are held for students who are considering admission in to the program. Call 503-7258241 or visit https://www.pdx.edu/social-work/information-sessions to schedule attendance at an informational meeting. Further information and admis sions forms can be obtained by visiting: https://www.pdx.edu/social-work/academics/programs/undergraduate/child-youth-and-family-studies.

CHILD, YOUTH, AND FAMILY STUDIES B.A./B.S.

## REQUIREMENTS

In addition to meeting the general University requirements, majors must complete the following program components:

| Required Courses |  |  |
| :---: | :---: | :---: |
| CFS 310 | Critical Histories in CYFS: | 4 |
|  | Gender/Race/Class |  |
| CFS 312U | Families in Lifecourse | 4 |
|  | Perspective |  |
| CFS 381U | Families, Stress, and Change | 4 |
| CFS 391 | Family Theories | 4 |
| CFS 487 | Examining Bias and Belief | 4 |
| CFS 488 | Structural Oppression | 4 |
| CFS 489 | Activis mforSocialChange | 2 |
| CFS 492 | Family Law and Policy | 4 |
| CFS 493 | Professional Self: Ways of | 2 |
|  | Knowing Professional Self: Critical |  |
| CFS 494 | Professional Self: Critical Thinking | 2 |
| CFS 495 | Profes sional Self: Identity | 2 |
| CFS 496 | Professional Self: Integration | 2 |
| CFS 497 | PracticumI | 5 |
| CFS 498 | PracticumII | 5 |
| Hst 343U | American Family History | 4 |
| Soc 339U | Marriage and Intimacy | 4 |
|  | or |  |
| Soc 461 | Sociology of the Family | 4 |
| SpEd 417 | Introductionto Special Education | 4 |
|  | or |  |
| SpEd 418 | Survey of Exceptional Learners | 3 |
| 16 credits of CFS electives from the following: |  |  |
| CFS 101 | Introduction to Child and Family Studies | 2 |


| CFS | Black Families in the U.S. | 4 |
| :---: | :---: | :---: |
| 318U/BSt |  |  |
| 318 U |  |  |
| CFS 320U | ABCs of Early Childhood | 4 |
|  | Education |  |
| CFS 330U | American Families in Film and | 4 |
|  | Television |  |
| CFS 340U | QueerFamilies | 4 |
| CFS 350U | Interpersonal Violence: Impact on Children \& Families | 4 |
| CFS 360 | Critical Disability: Impacts on | 4 |
|  | Children, Youth, \& Families |  |
| CFS 382U | Mental Dis orders: Is sues for | 4 |
|  | Families and Communities |  |
| CFS 385U | Working with Diverse Families | 4 |
| CFS 386U | Youth Healthy Relationships | 4 |
| CFS 388 | Sexual and Reproductive Justice in the United States | 4 |
| CFS 390U | Sex and the Family | 4 |
| CFS 393U | Community Resources and | 4 |
|  | Family Support |  |
| CFS 399 | Special Studies | 1-4 |
| CFS 410 | Selected Topics | 1-8 |
| CFS 410 | Child Life | 4 |
| CFS 450 | Youth Work Practice | 4 |
| CFS 486 | Parent and Family Education | 4 |
| Subtotal: 76 |  |  |
| All courses submitted to satisfy the requirements for a major in Child, Youth, and Family Studies must be passed with a grade of C or above. In addition, courses taken under the undifferentiated grading option (pass/nopass) will not be accepted toward fulfilling programmajor requirements, with the exception of CFS 493. |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
| CHILD, YOUTH, AND FAMILY STUDIES |  |  |
| MINOR |  |  |

## REQUIREMENTS

| Lower Division (4 credits) |  |  |
| :--- | :--- | ---: |
| Unst 228 | Families in Society Sophomore <br> Inquiry | 4 |
| Community-based learning (6 credits) |  |  |
|  | Arranged in consultation with <br> adviser; may be Capstone or <br> Practicum | 6 |
| Choose four of the following CYFS courses (16 credits) |  |  |
| CFS 101 | Introductionto Child and Family | 2 |
| CFS 310 | Studies <br> Critical Histories in CYFS: <br> Gender/Race/Class | 4 |
| CFS 312U | Families in Lifecourse <br> Perspective | 4 |


| CFS | Black Families in the U.S. | 4 |
| :---: | :---: | :---: |
| 318U/BSt |  |  |
| 318U |  |  |
| CFS 320U | ABCs of Early Childhood | 4 |
|  | Education |  |
| CFS 330U | American Families in Film and | 4 |
|  | Television |  |
| CFS 340U | QueerFamilies | 4 |
| CFS 350U | Interpersonal Violence: Impact | 4 |
|  | on Children \& Families |  |
| CFS 360 | Critical Dis ability: Impacts on | 4 |
|  | Children, Youth, \& Families |  |
| CFS 381U | Families, Stress, and Change | 4 |
| CFS 382U | Mental Dis orders: Is sues for | 4 |
|  | Families and Communities |  |
| CFS 385U | Working with Diverse Families | 4 |
| CFS 386U | Youth Healthy Relationships and | 4 |
|  | Sexuality Education |  |
| CFS 388 | Sexual and Reproductive Justice | 4 |
|  | in the United States |  |
| CFS 390U | Sex and the Family | 4 |
| CFS 391 | Family Theories | 4 |
| CFS 393U | Community Resources and | 4 |
|  | Family Support |  |
| CFS 399 | Special Studies | 1-4 |
| CFS 410 | Selected Topics | 1-8 |
| CFS 450 | Youth Work Practice | 4 |
| CFS 486 | Parent and Family Education | 4 |
| CFS 487 | Examining Bias and Belief | 4 |
| CFS 488 | Structural Oppression | 4 |
| CFS 489 | ActivismforSocialChange | 2 |
| CFS 492 | Family Law and Policy | 4 |

Note: CFS 310, CFS 391, CFS 487, CFS 488, CFS 489, CFS 492 require instructor approval and registration will be allowed based on enrollment.
Total Credit Hours: 26

## Social Work

600 Academic and Student Recreation Center 1800 SW Sixth Ave.
503-725-4712
www.pdx.edu/social-work/
The School offers Bachelor of Arts in Social Work (B.A.) and Bachelor of Science in Social Work (B.S.) degrees. The BSW Programis accredited by the Council on Social Work Education. Two graduate degree programs are offered by the School of Social Work: a Master of Social Work (M.S.W.) degree, which is fully accredited by the Council on Social Work Education, and a Ph.D. degree in Social Work and Social Research.

DEGREE MAPS AND LEARNING OUTCOMES

To view the degree map and expected learning outcomes for Social Work's undergraduate degree, go to www.pdx.edu/academic-programs/a-z.

## ADMISSION REQUIREMENTS

## Baccalaureate Social Work

Students must be admitted to the Baccalaureate Social Work (BSW) programin order to complete the requirements for the Bachelor of Arts or Bachelor of Science degree with a major in social work (B.A. or B.S.). Students are admitted as juniors ( 90 credits completed). Two cohorts will be admitted annually during spring term to start in the fall. One cohort will be admitted to our Portland campus programand one cohort to our BSW online program. Information on both options can be found on the website listed below. Additional information and an application formcan be obtained by calling 503-725-4712, by writing Portland State University, School of Social Work, PO Box 751, Portland, OR 97207, or by visiting the School's Web site, www.pdx.edu/social-work/bsw-bachelor-of-social-work.

Applicants to the BSW programmust have completed at least one: A) 4 credit 200 level course in psychology; B) 4 credit 200 level course in sociology; C) 4 credit 200 level course in human de velopment. Applicants are also advised to take SW 301 Introduction to Social Work, since this course is designed, in part, to assist interested students in selecting social work as a profes sion. If applicants have not completed this requirement prior to admis sion, they must take it once they are enrolled in the major.

The application packet mustinclude an application form, ans wers to es say questions, two reference forms, two reference letters, and an unofficial transcript fromall colleges thestudent has attended. Students will be required to attend an on-campus orientation session prior to beginning their course of study. Orientation schedule information will be provided at the time of admis sion. Students must also read the BSW ProgramHandbook, which is available online at www.pdx.edu/social-work/bsw-bachelor-of-social-work.

## Master of Social Work

Students are admitted once a year. Admis sion is selective; applications and all supporting materials mustbe submitted by the appropriate deadlines for consideration for admission in Summer or Fall terms. Early submis sion of application materials is encouraged. Further application information is available on-line through the school's website at: http://www.pdx.edu/ssw/.
The M.S.W . program of the School of Social W ork is open to qualified graduates from colleges and universities of recognized standing. Undergraduate preparation should include a broad background in liberal arts and sciences
including natural sciences, social sciences, and humanities. Competence in written and spoken English is important for social work practice. Students whose native language is not English should include the scores of the Test of English as a Foreign Language (TOEFL). Graduates of bachelor of social work (B.S.W.) programs accredited by the Council on Social Work Education may apply for advanced standing. Students whohave completedup to one year of study toward the M.S.W. degree at another graduate school of social work accredited by the Council on Social Work Education may apply for admis sion and transfer of credits.
Students admitted to themaster's programare required to be in continuous enrollment unless an approved leave of absence has been granted. A student who withdraws from the Schoolmust reapply.
For the M.S.W.-M.P.H. dual degree, students must submit separate applications toeach program(the School of Social Work and either the School of Community Health or the Mark O. Hatfield School of Government, depending on the focus of study) and will need to meet the minimum requirements for each program. The MSW Programand the MPH Health Promotion track admit students in fall term, while the MPHHealth Management and Policy track admits students every quarter. Additional guidelines for admis sions for Public Health are at https://ohsu-psusph.org/
It is possible to add a second programafter beginning one program, if the student completes an application and is accepted by the second programduring her/his first year in the entry program. Students musttake classes in both programs at the same time for at least one term.

## Doctor of Philosophy in Social Work and Social Research

Applicants for admission musthave a master's degree in social work or a related field. Applicants musthave writing ability and the capacity forcreative and independent work. At least two years of practice experience in social work or a related field is recommended. Students must apply to and be accepted into the doctoral programand be admitted to the University as a graduate student. As part of the admission procedure, students must furnish:

- transcripts of undergraduate and graduate studies;
- scores for the Graduate Record Examination (GRE);
- an example of scholarly writing;
- names of three references, two of whom must be academic;
- a personal statement; and
- a resume

Students whose native language is not English should include the scores of the TOEFL, IELTS or PTE-Academic
exam scores. Application materials for the Ph.D. program are available through the school's Web site at: www.pdx.edu/ssw/.
Application must be made by January 15 ; admission to the programis for the fall term only.

## Residence

Three consecutive terms must be spent in full-time residence ( 9 credit hours or more) on campus. The minimum credit hour requirement for the Ph.D. is 90 , of which at least 27 must be devoted to the dissertation. See the Portland State University general doctoral degree requirements (p.55).

SOCIAL WORK B.A./B.S.
The Baccalaureate Social Work (BSW) Programis fully accredited by the Council on Social Work Education (CSWE). The BSW Programprepares students to become entry-level professional generalistsocial workers who will work in a variety of settings and communities.
The BSW ProgramMis sion statementstates: The BSW Programat Portland State University combines theory with practical, hands-onexperience which prepares undergraduate students for careers in social work and related fields and for future graduate studies. Students in ourBSW Programgain knowledge, values, and skills to work with individuals, families, groups, organizations, and communities. Our programis committed to centering critical self-reflection, racial equity, and social and economic justice, and we encourage our students to be active citizens and practitioners who embody these values.
Students enter the BSW Programas a "cohort" oflearners. The cohort model provides a place for peersupport, sharing of ideas, and resources. Students also haveBSW advisors to support their academic and other educational needs. The curriculumprepares students with the social work knowledge, values, and skills to provide effective services to individuals, families, groups, and communities in diverse settings. The curriculum is based on a liberal atts foundation. In accordance with CSWE requirements, the BSW Programdoes not give credit for prior work experience and/or life experience. It is designed to promote mastery of competencies and practice behaviors mandated by the Council on Social Work Education (CSWE). The BSW major courses are taken within a two-year timeframe over six terms. The courses include social work history, social welfare policy, social work practice, research, human behavior and the socialenvironment, social justice theory and practice, and diversity electives. Students complete three terms of field education supervised by a qualified social worker. Students complete a 500 hour field practicumin conjunction with their practice courses and field seminar. The field practicumprovides students with the direct application of their knowledge, values, and skills in a variety of community agencies and settings. Students
who graduate fromthe BSW Programare prepared to become active social justice change agents ready to provide professional generalist social work practice in the community.

## REQUIREMENTS

In addition to meeting the general University requirements for a Bachelor of Arts or Bachelor of Science degree, majors must complete the following program components:

## Field Placement ( 12 credits)

Students are required to take SW 400 Field Placement and Seminar I-III over three academic terms for a total of 12 credits.

| Required Upper DivisionSocial Work Courses (39 credits) |  |  |
| :---: | :---: | :---: |
| SW 301U | Introductionto Social Work | 4 |
| SW 339 | Introductionto Oppression and Privilege | 4 |
| SW 340 | Advocacy forPolicy Change | 4 |
| SW 341 | Social Justice Practice | 4 |
| SW 350 | Human Behavior Through the Lifespan | 4 |
| SW 351 | Social Work Practice I | 4 |
| SW 430 | Social Work Practice II | 3 |
| SW 431 | Social Work Practice III | 3 |
| SW 432 | Social Work Practice IV | 3 |
| SW 450 | Social Work Research and Evaluation I | 3 |
| SW 451 | Social Work Research and Evaluation II | 3 |

## Equity and Inclusion Hectives (12 credits)

Students must choose three courses fromthe School of Gender, Race, and Nations. Subjects include: Black Studies;Indigenous Nations Studies; Chicano/Latino Studies; and Women, Gender, \& Sexuality Studies. Prospectivestudents may consult a complete list of approved courses at the School's Web site, www.pdx.edu/ssw/, where undergraduate program requirements are included in an on-line B.S.W. Student Map.
Upper Division Program Electives ( $\mathbf{1 2}$ credits)
Choose froma list; see advisor.
Subtotal: 75
SOCIAL WORK M.S.W.
The Master of Social Work (M.S.W.) programat Portland State Univers ity is fully accredited by the Council on Social Work Education (CSWE).

The mission of the Portland State University MSW programis to educate students for advanced leadership and practice that recognizes and dis mantles systems of oppression; builds racial equity and social, political, and economic justice; and advances the well-being of diverse individuals, families, groups, organizations, communities, and tribal nations. We endeavor to deliver a social work education that is critically informed, theoretically driven, empirically supported, reflexive, ethical, vigilant and resistive to colonial, heteropatriarchal, classist, and white supremacist agendas.

MSW Program Goals:
The MSW Programmission is realized by providing a statewide programthat prepares social workers for practice and leadership with diverse individuals, families, groups, communities and organizations.

The goal is to prepare MSW social workers to:
-
Provide advanced practice and leadership in healthcare and aging, clinical mental health, services to children, youth and families, communities, and/or organizations
-
Practice effectively with individuals, groups, families and communities to improve their well being
-
Demonstrate a professional use of self and a commitment to practice within social work values and ethics
-
Engage in critically informed, non-discriminatory, collaborative practice that addresses/challenges oppression and reflects respect, knowledge, and skills related to race, color, ethnicity, culture, social andeconomic class, sex, gender identity, sexual orientation, maritals tatus, family structure, language, national origin, age, dis ability, and religion
-
Use knowledge of systemic oppression and privilege, community and organizational change processes, and practice skills to advance social and economic justice
-
Analyze, formulate, and influence policies toimprove practice and advance social andeconomic justice

MSW ProgramMission

Use practice experience, empirical evidence, and theory to guide practice
-
Develop a plan and motivation for continued professional development, learning, and growth to enhance their social work skills and to contribute to the social work profession's efforts to advance social jus tice after graduation.

The master's programoffers students five courses of study: (1) a traditional full-time two-year course option; (2) a part-time three- or four-year option in Portland; (3) an advanced standing one-year option in Portland, Eugene, CentralOregon, and Online; (4) a part-time three-year distance options in Eugene and CentralOregon; and (5) a part-time three-year online option.

The curriculumcombines concurrent on-campus coursework and field work in a range of human service organizations. Typical practice settings are mental health programs, public welfare and human service agencies, schools, hospitals and health care centers, courts, family service agencies, correctional services, community planning agencies, legis lative offices, child and youth service agencies, neighborhood centers, multicultural service centers, and programs for older adults.

To ensure a common base for social work practice, the faculty has identified a required generalist foundation curriculum to be completed by all students in the MSW Program, except those admitted to advanced standing. This coursework focuses on the knowledge, values, skills and behaviors related to work with individuals, families, groups, communities and organizations. Three terms of concurrent generalist field internship are an integral part of this foundation.

The advanced curriculumincludes advanced concentrations, advanced field internship and electives. The M.S.W. Portland Programoffers two advanced concentrations: AdvancedClinical Practice and Advanced Macro Practice. The electives provide opportunities for students to have a deeper learning experience with a specific population, problems, or intervention.

The M.S.W. Distance Option (DO) programoffers one advanced concentration in AdvancedClinical Practice. In fall 2022, a new cohort of students will begin in Eugene. Eugene and Central Oregon will have cohorts in their second year. The Salemand Southern Oregon cohorts will have students in their final year of the program. While the first year of distance learning is course work only, second year yearstudents have 12 hour per week field internships and third year students have 16 hour per week field internships in or near their home communities. All Distance Option courses are offered on site or online. The

Central Oregon site will recruit new students for fall 2023.
The M.S.W. Online programoffers two adv anced concentrations: Advanced ClinicalPractice and Advanced Macro Practice. Course instruction is exclusively online using as ynchronous and synchronous delivery methods. Students will be expected to attend a virtual twoday orientation at the beginning of each academic year.
Required courses are offered during the academic year and electives are offered in the summer. The first year of the programis course work only, while the second year students have 12 hour per week field internships and third yearstudents have 16 hour per week field internships in or near their home communities.

Students admitted to the Ad vanced Standing option have a BSW from a CSWE accredited school of social work, and complete the advanced year of the curriculumover the course of four-five terms.

Students in the MSW programhave the ability to pursuea dual degree or certificate in specialized areas of practice.

Students may combine the M.S.W. with a Masters in Public Health (M.P.H.) by applying to both programs.

Students may obtain the M.S.W. with a certificate in gerontology through the Institute on Aging by completing specialized courses and field placement.

Students may also pursue licensure as a school social worker by completing a specialized set of courses and field placement.

Information about these dual degree and certificate programs is available on our website http://www.pdx.edu/social-work/msw-master-of-socialwork.

## REQUIREMENTS

The M.S.W. is a 78 credit program comprised of foundation and advanced coursework. Subtotal: 78

## FOUNDATION COURSEWORK

The foundation coursework can be satisfied in one of two ways:

## Option 1

Completion of a B.S.W. degree accredited by the Council on Social Work Education, plus 7 credits of bridge courses taken during the summer at PSU.
SW 513 Research Methods for Social Work Advanced Standing Students
SW 589 Advanced Standing Seminar

## Option 2

Completion of a 36 credit graduate foundation course sequence at PSU, which includes the following courses:
SW 511 Field Seminar and Field 1-4
SW 515 Skills for the Helping Process - 3 Groups
SW $520 \quad$ Social Welfare History and 3 Policy
SW 530 Social Work Practice with
Individuals and Families I Theory and Eng agement
SW 531 SW Practice with Individuals and
Families II Theory, Assessment and Intervention
SW 532 Advocacy and Empowerment 3
SW 539 Social Justice in Social Work 3
SW 541 Societal, Community and
Organizational Structures and Processes
SW 550 Introduction to Social Work

## ADVANCED COURSEWORK

The advanced coursework involves an additional 42 credits of advanced graduate courses.

## Advanced Concentrations

9 credits ( 3 credits per term) in one of the advanced concentrations:

## Advanced Clinical Practice

SW 533 Advanced ClinicalPractice I 3
SW 534 Advanced Clinical Practice II 3
SW 535 Advanced ClinicalPractice III 3
Advanced Macro Practice
SW $593 \quad$ Advanced Macro Practice I
SW 594 Advanced Macro Practice II 3
SW 595 Advanced Macro Practice III 3

## Advanced Field Placement

12 credits SW 512 Advanced field placement (4 credits each of three terms)
SW 512 Advanced Field Placement 1-4

## Eectives

21 credits of advancedelectives in their area of interest
Students may not receive credit for life experience, previous work experience, nor have any field experience or profes sional foundation courses waived on this basis.

## SOCIAL WORK AND SOCIAL RESEARCH PH.D.

The School of Social Work offers the Ph.D. in Social Work and Social Research to educate the next generation of scholars, researchers, teachers and leaders in social work and related fields. The programprepares students to contribute to scholarly knowledge, conduct ethical, rigorous, and community-engaged research, and teach passionately and effectively in various settings--all with special attention to equity and justice. The Regional Research Institute for Human Services and the Center for the Improvement of Child and Family Services are major resources for the program.
Cours ework includes core social work courses, required research electives, and selected substantive area electives. The core social work classes are taught seminar style, providing students with experiences of engagement in discussions about complexideas and diverse viewpoints. The elective courses can be taken in other academic units based on each student's individualized study plan. Following completion of required and elective courses the studentmust pass written and oral comprehensive examinations before defending a dissertation proposal, conducting independent research and a final dissertation defense.

## REQUIREMENTS

Each doctoral student is required to select a social problem for study and become knowledgeable about relevant theories and proficient in the methodologies appropriate for scholarly inquiry of the problem.
Core requirements for the course of study are designed to ensure knowledge and skills in the history, theory, and organization of societal responses to social is sues; quantitative and qualitative research methods and statistics; and expertise in a cognate area relevant to the social problemor method of inquiry through course work outside of the School of Social Work. Students also are required to enroll in a research practicumunder the direction of an approved qualified supervisor. A teaching practicummay be elected. Each student's programofstudy will be individually planned and approved. Students in the first and second years of the programare required to attend the Ph.D. seminar each quarter.

## Core Courses ( $\mathbf{3 1}$ credits)

SW 620 Substantive Area Conceptualization
$\begin{array}{ll}\text { SW 622 } & \text { Substantive Area Investigation } \\ \text { SW } & \text { Teaching and Learning in Healt }\end{array}$
SW Teaching and Learning in Health 3
626/PHE Promotion \& Social Work
626
SW 630 Philos ophy of Science for Social 3
Sciences
SW 637/Psy Qualitative Research Methods
637 for Social Inquiry
SW 640 Research Practicumand Seminar 3

| SW 650 | History of Social Work | 3 |
| :--- | :--- | :--- |
| SW 660 | Profession/al |  |
| Ph.D. Seminar - First Year | 1 |  |
| SW 661 | Ph.D. Seminar - Second Year | 1 |
| SW 690 | Teaching Practicumand Seminar | 3 |

SW 660 and SW 661 must be taken 3 times each for a total of 6 credits.

## Required Elective Courses ( $\mathbf{1 6}$ credits)

Appropriate interdisciplinary $\quad 16$ social scienceresearch methods courses
Other Eectives (16)
Appropriate courses in student's 16 substantive area of focus

## Dissertation (27 credits)

Subtotal: 90

## Comprehensive examination

A written comprehensiveexamination is taken after completion of required coursework.

## Dissertation

After successful completion of the comprehensive examinations, the dis sertation chairperson and committee are appointed. The student develops a dis sertation proposal that is defended orally before the dissertation committee. When the proposalhas been approved by the dissertation committee and by the University Human Subjects Research Review committee, the student is considered a candidate for the Ph.D. in Social Work and Social Research. A dissertation must be completed following the outlines of the approved proposal. Students must maintain continuous registration while engaged in dissertation research.

## Final examination

At the conclusion of doctoral work, the student defends the completed dis sertation before the dis sertation committee and other interested faculty and doctoralstudents. The student is expected to demonstrate knowledge of the topic selected for study and to show that the dis sertation is a contribution to knowledge in the social problemarea.

## RESEARCH CENTERS AND INSTITUTES

## Center for Improvement of Child and Family Services (CCF)

Portland Campus: 1600 SW 4th Ave., 4th floor
Child Welfare Partnership Training Center: 626High
Street NE, Suite 400, Salem, OR 97301
503-725-5022

Marty Lowrey, Child Welfare Partnership Director Beth Green, Director of Early Childhood \& Family Support Research
Brooke Rizor, Director, Systemof Care Institute
Our vision is that all children, youth, and families are safe, connected, and thriving, supported by effective and equitable organizations, institutions, and community systems. Webuild the capacity of human service organizations and systems to improve theequity and effectiveness of services and community supports for children, youth, and families. We:

- Build the workforce through training, education, coaching, and mentoring
- Inform and advance systems change through convening, collaborating, and consultation
- Ground our work with research, knowledge partnerships, and programevaluation.

The Center was founded in 1994 as the Child Welfare Partnership (CWP). This partnership continues today, as a collaboration with the Oregon Department of Human Services (DHS) offering training, research and social work education to improve Oregon's child welfare system. The CWP training program, located in Salem, prepares all new child welfare workers, supervisors, caregivers, and advanced staff using state of the art adult education approaches (including a simulation lab). All offerings are evaluated for quality assurance and measurement of impact. The Child Welfare Partnership's Education Program(CWEP) provides financial support and customized professional education for bachelor and master's level social work students committed to careers in child welfare and includes an evaluation of program impact. This programincludes theCulturally Responsive Leaders program, designed to prepare child welfare leaders to serve the growing diversity of child welfare clients.

The Center's SystemofCare Institute(SOCI) offers training, technical as sistance and consultation using a community based, culturally responsive and family and youth-driven care lens. Currently SOCI is supporting the full implementation of Wraparound and Systemof Care across the state of Oregon and focusing on cross-system collaboration. The System of Care Institute also works in other states and tribes as requested, to promote Systemof Care, improvement of child-serving systems, and sustainable workforce development.
The Center's Early Childhood and Family Support
Research Teamworks on a robust research agenda related to early childhood, child abuse prevention, family support and child welfare. This teamprovides programevaluation and community capacity building research across Oregon and nationally to promote family engagement, and advance best practices in early childhood support and education. The mission of this teamis to engage in equity-driven research, evaluation, and consultation to
promote social justice for children, youth, families and communities. A full menu of research projects is available on the CCF website.

For further information about all programs and projects, visit the Center website at http://www.pdx.edu/ccf/

## Regional Research Institute for Human Services

1600 SW 4th Ave., Suite 900
503-725-4040
Mary Oschwald, Director
The Regional Research Institute for Human Services (RRI) was es tablished in 1972 by the School of Social Work at Portland State University with a grant fromthe Social and Rehabilitation Service within the office of Health, Education, and Welfare (HEW). The aim of the RRI is to improve the manner in which social services and service delivery systems are designed, managed, and evaluated. To inform social change initiatives, the RRI is prepared to examine all aspects of the complexprocess by which human service policies and services are developed and implemented. By bringing a range of consumers, family members, and researchers into its activities, the RRI creates new approaches to old problems. It strives to set high standards for applied social research and to provide a research environment for graduate training.

The RRI has undertaken more than 250 projects, many of themnational in scope, in fields of child and adult mental health, family and child welfare, child care, employment, juvenile justice, alcohol and drug services, disability, and interpers onal violence. RRI projects range fromlarge, multi-s ite federally funded grants, to research contracts with state and local governments, to programevaluations in collaboration with local community partners. The RRI is particularly well known for its innovative approaches in consumer-driven and community-engaged research. Over the last five years, total res earch expenditures for RRI projects have exceeded $\$ 32$ million.
The RRI is home to several centers with national scope and influence. Since 1984, when the Research and Training Center on Family Support and Children's Mental Health was initiated, the RRI has been a leader in the field of mental health research and education. The RRI als o hosts Trauma Informed Oregon (TIO), which serves as a centralized source of information and resources, and coordinates and provides training for healthcare and related systems. Since 2000, the national programoffice of Reclaiming Futures: Public Health, Justice, Equity, has been located in the RRI and promotes new standards of care in juvenile justice for young people with drug and alcohol problems, and its model for systemchangehas been implemented in juris dictions around the country.

Formore information about RRI faculty, research projects, and publications, see www.pdx.edu/regional-researchinstitute.

## COLLEGE OF URBAN AND PUBLIC AFFAIRS

Sy Adler, Ph.D., Interim Dean
Laura J. Hickman, Ph.D., Interim Ass ociate Dean
Gil Miller, Ph.D., AssistantDean
750 Urban Center, 503-725-4043
www.pdx.edu/urban-public-affairs/
The College of Urban and Public Affairs joins the disciplines of urban studies, public administration, criminology \& criminal justice, political science, economics, and international \& global studies under one roof. Just outside the doors of the Urban Center-in one of the nation's most innovative urban regions-ourstudents and faculty fuse theory and practice into solutions for the common good. Our students and faculty collaborate with community org anizations, imagine original solutions, and implement themin real-time. Upon graduation, our students are equipped to improve the livability of their communities.

In a state where land-use planning, transportation, environmental as pects of urban growth, community policing, low-income housing, solid waste recycling, and community engagement are a model for the nation, our urban location provides the perfect applied laboratory for the college's groundbreaking work.

## Mark O. Hatfield School of Government

The Mark O. Hatfield School of Government is one of the well-known public policy schools in the country. It includes Political Science, and Public Administration. Our nationally-ranked programs in public administration, nonprofit management and politicalscience help prepare students to improve the way we govern and lead. Faculty and students of the Hatfield School are involved in an impressive range of community collaborations around public policy and administration, civic leadership.

## Nohad A. Toulan School of Urban Studies and Planning

The Toulan School of Urban Studies and Planning is the nation's oldest continuously operating instructional programin urban studies. Graduates can be found in public, private, and nonprofit planning offices throughout North America and around the globe. The mis sion of the school is to assist in the development of healthy communities through an interdisciplinary programof teaching, research, and public service.

## Department of Criminology \& Criminal Justice

The Criminology \& Criminal Justice Department brings togetherstudents and faculty who are interested in a) studying the causes, prevention, and control of criminal behavior andb) promoting efficiency, effectiveness, and equity at all levels of the criminal justice system. The department offers a bachelor's degree, minor, postbaccalaureate certificate and master's degree. Each programis designed to equip students with career-relevant skills for lifelong professional success and the practical tools needed for helping to improve and reform the criminal justice system.

## Department of Economics

The mission of the Department of Economics is to provide high-quality graduate and undergraduate education while generating top-notch applied and theoretical research that garners national recognition within a supportive academic community. The department offers a wide range of courses and a variety of academic degrees, including bachelor's degrees, a master's degree, and a four-course Graduate Certificate in Environmental and Natural Resource Economics. The department also sponsors year-round seminars for students that address crucial policy-oriented and theoretical topics.

## Department of International and Global Studies

The Department of International and Global Studies endeavors to foster a deep understanding of globalissues, such as socialjustice and human rights, international development, environmental justice, health, international conflicts, gender and sexuality, and laborrights. We offer fourB.A. concentrations: two thematic, interdisciplinary options, in Global Studies and International Development Studies, and two with regional specialization, in Asian Studies and Latin American Studies. The department also offers a minor and seven undergraduatecertificates designed to add a global dimension to any degree. Our programs offer an excellent foundation for careers in which an understanding of global economic, political, social, historical, and cultural processes is important. Ourstudents have also secured admis sion to top interdisciplinary and traditional graduate programs in the US and overseas.

## Department of Political Science

The Political Science Department is dedicated to understanding the nature of power and governance, and to giving students the tools they need to make a meaningful difference in their communities. Students have the opportunity to focus on the four main fields of political science - American, Comparative, International Relations, and Political Theory - and may also specialize in several
other subfields such as law, public service, international development, campaign management, and women's leadership. Career possibilities for graduates abound because students can customize their degree program around hands-on concentration options, multi-disciplinary opportunities, internships, and rigorous curricula. Graduate students enter a world of professional academic scholarship and analysis, preparing themfor doctoratelevel study or leadership careers at non-governmental organizations, think tanks, or political consulting.

## Department of Public Administration

The Public Administration Department is home to ten multidisciplinary programs designed to equip current and future leaders in addressing contemporary social issues in the public sector, non profit sphere, health care administration, and beyond. Our faculty and community of instructors offer decades of wisdom gleaned fromboth studying and applying theory. This wis dom is continuously being practiced and refined, as faculty members and instructors remain actively engaged in scholarship, service, and practice. Our Department provides education and profes sional development, engages in applied research and consulting with public sector partners, and leverages the scope of these activities through publication.

## Graduate Certificates

- Certificate in Applied Social Demography
- Graduate Certificate in Collaborative Governance
- Graduate Certificate in Econometrics and Data Analysis
- Graduate Certificate in Emergency Management and Community Resilience
- Graduate Certificate in Energy Policy and Management
- Graduate Certificate in Environmental and Resource Economics
- Graduate Certificate in Gerontology
- Graduate Certificate in Nonprofit and Public Management
- Graduate Certificate in Real Estate Development
- Graduate Certificate in Sustainable Food Sy stems
- Graduate Certificate in Transportation
- Graduate Certificate in Urban Design


## Undergraduate Certificates

- Post-Baccalaureate Certificate in Criminology \& Criminal Justice
- Global Studies Certificate
- International DevelopmentCertificate
- African Studies Certificate
- Asian Studies Certificate
- European Studies Certificate
- Latin American Studies Certificate
- Middle East Studies Certificate
- Contemporary TurkishStudies Certificate (not accepting new admis sion to the certificate)
- Campaigning to Win a U.S. Political Campaign
- Women's Leadership
- InstitutionalEconomics


## Non-Credit Certificates

- Professional Certificate in Nonprofit Fundraising
- Professional Certificate in Nonprofit Program Evaluation
- Certificate in Tribal Relations


## Minors

- Minor in Civic Leadership
- Minor in Community Development
- Minor in Criminology and Criminal Justice
- Minor in Law and LegalStudies
- Minor in Political Science
- Minor in International \& Global Studies
- Minor in Economics
- Minorin InternationalEconomics
- Minor in Political Economy
- Minor in Sustainable Urban Development


## Bachelor Degrees

- B.A., B.S.-Criminology and Criminal Justice
- B.A., B.S.-Community Development
- B.A., B.S.-Political Science
- B.A., B.S.-Political Science:International Development
- B.A., B.S.-Political Science:Public Service
- B.A., B.S.-Urban and Public Affairs
- B.A., B.S.-Economics
- B.S.-Quantitative Economics
- B.A.-International \& Global Studies: Africa (not accepting new admission to this concentration)
- B.A.-International \& Global Studies - Asia
- B.A.-International \& Global Studies-Europe (not accepting new admission to this concentration)
- B.A.-International \& Global Studies - Latin America
- B.A.-International \& Global Studies-Middle East (not accepting new admission to this concentration)
- B.A.-International \& Global Studies - International DevelopmentStudies
- B.A.-International \& Global Studies -Global Studies
- Combined Undergraduate/Graduate Program: B.S.Quantitative Economics and M.S. in Economics


## Graduate Degrees

- M.S.-Criminology and Criminal Justice
- M.A.,M.S.-Economics
- M.S.-Emergency Managementand Community Resilience
- E.M.P.A.-Executive Master of Public Adminis tration
- M.P.A.-Nonprofit Management
- M.P.A.-Natural Resource Policy and Administration
- M.P.A.-Local Government
- M.P.A.-GlobalLeadership and Management
- M.P.A.-Human Resource Management
- M.P.A.-Health Management and Policy
- M.P.A.-Health Administration
- M.P.P.-Master of Public Policy
- M.R.E.D.-Master of RealEstate Development
- M.S.-PoliticalScience
- M.U.R.P.-Master of Urban and Regional Planning
- M.U.S.-Master of Urban Studies
- Ph.D.-Public Affairs and Policy
- Ph.D.—Urban Studies, Urban Studies:Regional Science

Graduate programs

## MASTER OF SCIENCE IN EMERGENCY MANAGEMENT AND COMMUNITY RESILIENCE

The Master of Science in Emergency Management and Community Resilience is designed to educate professionals in public, private, and nonprofit org anizations whose jobs include res ponsibility for planning and organizing response to disasters, both natural and human made. The curriculum of this graduate programis designed at the intersections of scientific research, applied public policy, and effective cris is leadership - as well as at the crossroads of multiple disciplines and approaches to dis aster and resilience. This trans disciplinary approach to understanding emergency management and community resilience offers a rich intellectual and applied basis for graduate study.

## CORE COURSE REQUIREM ENTS

Each student must enroll in and successfully complete nine core courses as outlined below:

| EMCR 520 | Anatomy and History of Disasters | 4 |
| :---: | :---: | :---: |
| EMCR | Building Community Resilience | 4 |
| 530/USP |  |  |
| 530 |  |  |
| EMCR | Strategies for Organizing | 3 |
| 535/PA 535 | Recovery, Mitigation and Resilience |  |
| EMCR | Principles and Practices of | 3 |
| 587/PA 587 | Emergency Management |  |
| EMCR | Risk and Strategic | 4 |
| 545/Comm | Communication |  |
| 545 |  |  |
| EMCR | International Perspectives on | 3 |
| 588/PA 588 | Dis aster Management \& |  |
|  | Resilience |  |
| EMCR | Culture, Vulnerability and | 4 |
| 591/Anth | Disaster Resilience |  |
| 591 |  |  |
| EMCR 595 | Capstone Seminar in Emergency | 4 |
|  | Management and Resilience |  |
|  | Climate Resiliency Planning | 3 |
| 560/USP |  |  |
| 560 |  |  |
|  | or |  |
| EMCR | Community Resilience in | 4 |
| 567/Geog | Coupled Socio-Ecological |  |
| 567 | Systems |  |

## SKILLS AND METHODS REQUIREMENTS

Students must take a minimum of three courses (9 credits), with a minimum of one in each of the two Skills and Method Areas:
1.

Research Design, Evaluation, Communication, and Assessment

## 2.

Qualitative and Quantitative Methods
These courses focus on skills and methodologies that support varied careers within the emergency management profes sion. A list of approved electives is available from the ProgramDirector.

FIELD SPECIALIZATION REQUIREMENTS
Students in this programmust take a minimum of four courses ( 12 credits) within one of the fourField Specializations:

1. Natural Systems, Sustainability and Resilience
2. Public Health Response and Promotion
3. Organizational Strategies for Effective Emergency Management
4. Social Resilience, Culture and Community

A list of approved electives is available fromthe Program Director.
Total Credit Hours: 53-54

## GRADUATE CERTIFICATE IN EMERGENCY MANAGEMENT AND COMMUNITY RESILIENCE

The Graduate Certificate in Emergency Management and Resilience is a five course programorganized as follows:

## CORE COURSES

| EMCR 520 | Anatomy and History of | 4 |
| :--- | :--- | :--- |
|  | Disasters |  |
| EMCR | Building Community Resilience | 4 |
| 530/USP |  |  |
| 530 |  | 4 |
| EMCR | Culture, Vulnerability and |  |
| 591/Anth | Disaster Resilience |  |
| 591 |  |  |

## ONE OF THE FOLLOWING:

| EMCR | Strategies for Organizing | 3 |
| :--- | :--- | :--- |
| 535/PA 535 | Recovery, Mitigation and |  |
| EMCR | Resilience | Principles and Practices of |

ONE OF THE FOLLOWING:

| EMCR | Risk and Strategic | 4 |
| :--- | :--- | :--- |
| 545/Comm | Communication |  |
| 545 |  |  |
| EMCR | International Perspectives on | 3 |
| 588/PA 588 |  |  |
| EMCR | Resilience | Climate Resiliency Planning |

Total CreditHours: 18-19
Undergraduate programs

URBAN AND PUBLIC AFFAIRS B.A./B.S. DEGREE MAPS AND LEARNING OUTCOMES

To view the degree maps and expected learning outcomes for the College of Urban and Public Affairs undergraduate degree, go to www.pdx.edu/academic-programs/a-z.

## PROGRAM REQUIREMENTS

## Internship/fieldexperience (4 credits)

Choose to perform your Internship/field experience requirement through the UPA 409 Practicumcourse, or an approved course fromany participating academic unit to complete your senior or late junior year.

## Dean's seminar (4 credits)

The Dean's seminar is to be completed in senior year. UPA 425 CUPA Dean's Seminar

## Research skills course (4 credits)

Complete a pre-identified and approved research methods, statistics, or data analy sis course fromany of the participating academic units.

| CCJ 340 | Crime Analysis | 4 |
| :--- | :--- | ---: |
| CCJ 380 | Criminal Justice Research | 4 |
| PHE 450 | Epidemiology | 4 |
| PS 495 | Topics in Specialized Research | 4 |
| Stat 243 | Methods for Political Science <br> Introductionto Probability and | 4 |
| USP 430 | Statistics I <br> Participatory Research Methods | 4 |
| USP 440 | for Community Development <br> Critical Analysis of Community | 4 |
|  | Data |  |

## USP 452

GIS for Community Development

## Elective courses ( 20 credits)

Choose 5 courses with no more than 3 courses fromCCJ, PA, PS, USP, PHE, Ec, Intl, or UPA. All of the 20 required credits must be fromupper-division (300-or 400-level) courses.

## Required courses ( $\mathbf{2 4}$ credits)

Students must complete 6 courses representing at least 3 of the 7 academic disciplines listed below:
$\begin{array}{ll}\text { CCJ } 200 & \begin{array}{l}\text { Criminology and Criminal } \\ \\ \text { Justice }\end{array}\end{array}$

| CCJ 230 | Policing in America or | 4 |
| :---: | :---: | :---: |
| CCJ 240 | Punishment andCorrections | 4 |
| CCJ 330U | Crime Control Strategies | 4 |
| PA 311U | Introduction to Civic | 4 |
|  | Engagement |  |
| PA 312U | Foundations of Community | 4 |
|  | Leadership |  |
| PA 313U | Fundamentals of Public Service | 4 |
| PS 101 | United States Government | 4 |
|  | or |  |
| PS 102 | United States Politics | 4 |
| PS 204 | Comparative Politics | 4 |
|  | or |  |
| PS 205 | International Politics | 4 |
| PS 431 | State and Local Politics | 4 |
| USP 300U | Introduction to Urban Studies | 4 |
| USP 301U | Introductionto Community | 4 |
|  | Development |  |
| USP 311U | Introduction to Urban Planning | 4 |
| PHE 350 | Health and Health Systems | 4 |
| PHE 446U | Health Equity and Social Justice | 4 |
| PHE 250 | Our Community: Our Health | 4 |
| Ec 201 | Principles of Microeconomics | 4 |
| Ec 202 | Principles of Macroeconomics | 4 |
| Ec 332U | Economics of Environmental | 4 |
|  | Issues | 4 |
| Intl201 | Studies |  |
| Intl 296 | The United States and the World | 4 |
| Intl397 | Theory and Policy in | 4 |
|  | International Development |  |

Students will be expected to receivea "C" or better in all required coursework. At least 9 upper-division courses must be taken as part of the 56 credits; further, at least 24 of the required 56 credits mustbe taken at PSU.

Subtotal: 56

## Criminology and Criminal Justice

550 Urban Center
503-725-4014
https://www.pdx.edu/criminology-criminal-justice/

- B.A., B.S. (Fully Online Available)
- Minor (Fully Online Available)
- Postbaccalaureate Certificate (Fully Online Available)
- M.S.

The Department of Criminology \& Criminal Justice emphasizes the generation and practical application of empirical evidence to crime and justice is sues. We seek to promote effectiveness, efficiency, and equity in crime prevention and controlefforts by (1) providing students with quality educational experiences that prepare themfor lifelong profes sional success, (2) conducting and disseminating research on theoretical and policy-relevant topics, and (3) collaborating with justice-related org anizations to as sess, evaluate, and improve policy and practice. OurDepartment values empiricalinquiry, access to higher education, diversity, social justice, and community engagement.

## Undergraduate Program

The Department of Criminology \& Criminal Justice offers both a campus-based and fully online pathway toward its bachelor degree. The undergraduate programseeks to educate students about the causes, consequences, prevention, and control of criminal and law-violating activity at multiple levels of analysis. Our undergraduate curriculumfocuses on (1) criminology and criminal justice theories and empirical research addressing the role of individuals, families, communities, and society in the production and prevention of crime, (2) the justice system's function in controlling crime, and (3) a critical analys is of the effectiveness, efficiency, and equity of related policies and practices. Educational experiences facilitated inside and outside of class help promote students' long termprofessional success by developing their capacity for critical reasoning, problem-solving, and effective communication.
Criminology \& Criminal Justice is an interdisciplinary major, a fact demons trated by the diverse backgrounds of our full-time and part-time faculty. Students graduating from our programhave a wide range of choices when they look for employment or post-graduateeducation. Recent graduates have found jobs in law enforcement (e.g., police officer, immigration, crime analyst), courts (e.g., victim advocate, administration), corrections (e.g., parole officer, facility management), human services (e.g., offender
counseling, child welfare), and crime prevention (e.g., neighborhood crime prevention specialist, private security). Other alumni from our programhave goneon to pursueadvanced degrees in such areas as law, criminal justice, psychology, socialwork, public administration, and urban planning.

## DEGREE MAPS AND LEARNING OUTCOMES

To view the degree map and expected learning outcomes for Criminology \& Criminal Justice's undergraduate degree, go to www.pdx.edu/academic-programs/a-z.

## ADMISSION REQUIREMENTS

Admis sion to the department is based on general admis sion to the University. See Admis sions Requirements (p. 8) for more information.

There is an auxiliary application for the fully online program. For more details, please vis it www.pdx.edu/criminology-criminal-justice.

## CRIMINOLOGY AND CRIMINAL JUSTICE,

 B.A./B.S.
## REQUIREMENTS

In addition to meeting the generaluniversity degree requirements, students who major in Criminology \& Criminal Justice (CCJ) must complete core and elective courses within the department. Some of thes e courses require senior status, and students should read course descriptions in the currentPSU Bulletin before regis tration. All core and elective courses submitted to satis fy the requirements for the major, whether taken at PSU or elsewhere, must be passed with a grade of"C" (2.00 GPA) or above. A course grade of C-does not satisfy this requirement. Courses taken under the undifferentiated grading option (pass/nopass) will not be accepted toward fulfilling department major requirements. The CCJ degree requirements are:

## Core Courses

Transferequivalent courses may hold a different credit value than the ones listed here.

| CCJ 200 | Criminology and Criminal <br> Justice | 4 |
| :--- | :--- | :--- |
| CCJ 230 | Policing in America | 4 |
| CCJ 240 | Punishment and Corrections | 4 |
| CCJ 310 | American Courts | 4 |
| CCJ 317 | Race, Crime, and Criminal | 4 |
|  | Justice |  |
| CCJ 320U | Theories of Crime \& Justice | 4 |
| CCJ 330U | Crime Control Strategies | 4 |
| CCJ 340 | Crime Analysis | 4 |
| CCJ 380 | Criminal Justice Research | 4 |


| CCJ 404 | Cooperative Education/Internship | 8 |
| :--- | :--- | :--- |
| CCJ 420 | Criminal Law and Legal | 4 |
|  | Reasoning |  |

Subtotal: 45-48

## CCJ Electives

Students take 8 credits of courses from the 100-400 level range. An additional 16 credits must be taken at the 300400 level range, totaling 24 credits.

Subtotal: 24
Subtotal: 69-72

## CRIMINOLOGY AND CRIMINALJUSTICE MINOR

## REQUIREMENTS

Students who minor in CCJ must complete core and elective courses within the department. All courses submitted to satisfy the requirements for the minor, whether taken at PSU or else where, must be passed with a grade of C (2.00 GPA) or above. A course grade of Cdoes not satisfy this requirement. Courses taken under the undifferentiated grading option (pass/no pass) will not be accepted. The CCJ degree requirements for the minor are:

## Courses

CCJ 200
Criminology and Criminal 4
Justice
CCJ 320U Theories of Crime \& Justice 4
CCJ 330U Crime ControlStrategies 4
CCJ elective credits (minimum 16
of 8 credits at or above 300-
level)

## One course from list below

CCJ $230 \quad$ Policing in America 4
CCJ 240 PunishmentandCorrections 4
CCJ 310 American Courts 4
Subtotal: 32

## CRIMINOLOGY AND CRIMINALJUSTICE POST-BACCALAUREATE CERTIFICATE

To earn a post-baccalaureatecertificate in criminology and criminal justice students must complete core and elective courses within the department. Some of these courses may have prerequisites and students should read course descriptions in the currentPSU Bulletin before registration. All core and elective courses submitted to satisfy the requirements for a post-baccalaureate certificate, whether taken at PSU or els ewhere, must be passed with a grade of "C" (2.00 GPA) or above. A course grade of C - does notsatisfy this requirement. Courses taken under the undifferentiated grading option (pass/no pass) will not be accepted toward fulfilling these requirements.

The CCJ degree requirements for a post-baccalaureate certificate are:

## REQUIREMENTS

| Courses |  |  |
| :---: | :---: | :---: |
| CCJ 200 | Criminology and Criminal | 4 |
|  | Justice |  |
| CCJ 320U | Theories of Crime \& Justice | 4 |
| CCJ 330U | Crime ControlStrategies | 4 |
| CCJ 380 | Criminal Justice Research | 4 |
| CCJ 420 | Criminal Law and Legal | 4 |
|  | Reasoning |  |
|  | CCJ elective credits (minimum | 12 |
|  | of 8 credits at or above 300- |  |
|  | level) |  |
| Two courses from list below |  |  |
| CCJ 230 | Policing in America | 4 |
| CCJ 240 | Punishment and Corrections | 4 |
| CCJ 310 | American Courts | 4 |
| Subtotal: 40 |  |  |

Total CreditHours: 40

## Graduate Program

## ADMISSION REQUIREMENTS

In addition to the general University requirements for admission to graduate study, prospective students should arrange for the Department of Criminology and Criminal Justice to receive:

1. CCJ Graduate Programapplication submitted online. Please vis it site:
https://www.pdx.edu/admis sions/apply-to-gradschool to apply.
2. Transcripts fromeach post-secondary institution attended, including PSU.
3. Two (or more) letters of recommendation fromfaculty members at colleges or universities previously attended, or from others in a position to comment on the student's academic and professional background and experience.
4. A 500-word statement of purpose describing academic and professional career goals, including subfields of primary interest. The statement may also be used to provide any other additional information pertinent to the applicant's qualifications.
5. Applicants required to submit TOEFL scores to the Office of Admissions should also submit them to the Department.
6. A resume or curriculumvita is optional.
7. Students interested in a Graduate Assistantship should indicate this on their application.

In order to be considered for regular admis sion to the program, applicants should have a totalundergraduate GPA of 3.20 or higher or a graduate GPA of 3.20 or higher for a minimum of 9 credit hours.

CRIMINOLOGY AND CRIMINAL JUSTICE M.S.
The Department of Criminology and Criminal Justice offers a programof study designed to provide students a broad-based understanding of the criminal justice system and society's response to crime. A major goal of the programis to developunderstanding of the applied and theoretical aspects of crime and criminal justice.

The programprovides students with a high degree of flexibility and allows students to tailor the programto match their own career interests. Core coursework consists of classes in the theoretical foundations of criminology and criminal justice, methodology, and criminal justice policy analys is.

Students are required to develop a specialization in a substantive area outside of the Department of Criminology and Criminal Justice. In consultation with an adviser, students identify and complete a minimum of three clas ses, thereby creating a specialty that is unique for each student. Potential specialization fields include social work, social justice, public management, public policy, political science, urban studies, geographic information systems, and crime analys is.
The Criminology \& Criminal Justice Graduate program seeks to create a meaningful learning experience and foster professional development for its students based on the following principles:

1. Community of Learners: Graduate students and faculty are in volved in a community based on collegial and collaborative relationships evidenced by co-learning and critical dialogue in the clas sroom and student-faculty partnerships outside of the classroomon writing, research, and community engagement projects.
2. Initiative and OriginalThinking: Graduate students are encouraged and given opportunities to participate in the management of their own education experiences and develop new understandings of knowledge and professional practice.
3. Synthesis and Evaluation: Students practice the integration of theory and empirical literature on given criminology and criminal justice topics in order to develop sound theoretical and practical evaluations and to present findings through oral and written reports.
4. Methodological and Analytical Experiences: Graduate students are afforded opportunities to practice the development and implementation of research
methodologies and execution of basic statistical analyses of empirical data.
5. Self-Assessment: Graduate students are expected to articulate their career goals and develop evidence of their professional growth related to theory, research, policy, communication, justice, diversity, and community engagement.

## DEGREE REQUIREMENTS

All candidates for a master's degree must complete a minimum of 51 graduate credits distributed as follows:

1. 24 credit hours must betaken in the substantivecore.
2. 18-21 credits of elective courses, in which 9-12 credit hours may be used to fill a specialization field.
3. 9 credit hours of thesis or project work.
4. Succes sful submission and defense of a portfolio, field project or thes is.

| Substantive Core |  |  |
| :---: | :---: | :---: |
| CCJ 512 | Institutions of the Criminal | 3 |
|  | Justice System |  |
| CCJ 513 | Professional Orientation in | 3 |
|  | Criminology and Criminal |  |
|  | Justice |  |
| CCJ 515 | Theories of Crime and Justice | 3 |
| CCJ 520 | Analysis of Crime and Justice | 3 |
|  | Data |  |
| CCJ 521 | Advanced Regression in | 3 |
|  | Criminology \& Criminal Justice |  |
| CCJ 525 | Criminal Justice Theory | 3 |
| CCJ 530 | Criminal Justice Research | 3 |
| CCJ 535 | Criminal Justice Policy | 3 |

## Specialization Field

In consultation with an adviser, students will be required to develop and complete a specialization field as a part of their degree requirements. A minimum of three classes, totaling $9-12$ credits must be completed in the specialization field. Students are encouraged to complete this requirement by taking courses in other academic units such as social work, public adminis tration, computer science, political science, sociology, or geography. Courses may be selected fromseveral academic units so long as they comprise a coherent field of study that will contribute to the academic development of the student.

## Elective Courses

Students must satisfactorily complete 18-21 credit hours of elective courses, with at least 12 credits taken in the Department of Criminology and Criminal Justice.

## Portfolio, Field Project, or Thesis

Candidates must complete one of three options as part of their culminating experience. The options include a
portfolio, field project, or traditional thesis, all of which require a final oral examination. Successful completion of one of these three options is a graduation requirement.

- Thes is: A thesis is a scholarly work that demonstrates substantial capacity on the part of the student to engage in independent investigation. Students must submit a letter of interest and thesis prospective to the CCJ Graduate Committee for approval before procee ding with the thes is option. To satisfy thesis requirements, students must pose an empirical research question and apply appropriate methods of scholarship to that question in order to generate new knowledge.
- Field Project: A field project involves the student contributing their accumulated programknowledge and technical skills to a report, presentation, or other product that directly benefits an external agency. The field project must have a strong applied focus and address a specific professional or org anizational need. Students must submit a letter of interest and field project prospectus to the CCJ Graduate Committee for approval before proceeding with the field project option.
- Portfolio: All CCJ Masters students will complete a portfolio unless they opt for a thesis or field project. The purposes of the portfolio are to facilitate students' learning and intellectual development, document accomplishments, and assess students' specialized skills and professional knowledge. Portfolio students will create an electronic portfolio (e-portfolio) to document, evaluate, integrate, and reflect upon their learning experiences.


## Economics

450 Urban Center Building (URBN)
503-725-3915
503-725-3945 (fax)
www.pdx.edu/economics
econ@pdx.edu

## Undergraduate Programs

- B.A., B.S.
- B.S. in Quantitative Economics
- DepartmentalHonors
- Minor in Economics
- Minor in InternationalEconomics
- Minor in Political Economy
- Certificate in Institutional Economics


## Graduate Programs

- M.A., M.S.
- Graduate Certificate in Environmental and Resource Economics
- Graduate Certificate in Econometric and Data Analy sis

Combined Undergraduate/Graduate Program

- B.S.Q.E. + M.S.


## Economics participates in the following programs:

- Ph.D. in Public Administration Policy
- Graduate Certificate in Energy Policy and Management
- Graduate Certificate in Sustainability
- Urban Honors
- Secondary Education Program-SocialScience
- M.S.T. and M.A.T. (GeneralSocial Science)


## Undergraduate programs

Economics majors are advised to contact the department undergraduate advisor for as sistance with planning an individualized programof study. Economics majors who are cons idering graduate school will need to tailor their undergraduate programfor this purpose and should seek advice prior to the start of their junior year. It is strongly recommended that students interested in graduate school pursuea B.S. in Quantitative Economics.

## DEGREE MAPS AND LEARNING OUTCOMES

To view the degree maps and expected learning outcomes for Economics' undergraduate degrees, go to
www.pdx.edu/academic-programs/a-z.

## ADMISSION REQUIREMENTS

Admis sion to the department is based on general admis sion to the University.

ECONOMICS B.A./B.S.

## REQUIREMENTS

The BA and BS in Economics serve as the core of a liberal arts programand provide the fundamentals of economic analys is for students seeking a professional career in business, government and non-profit sectors.
In addition to meeting general university degree requirements, students must satisfy the following departmental requirements:

| Economics Core |  |  |
| :---: | :---: | :---: |
| Ec 201 | Principles of Microeconomics | 4 |
| Ec 202 | Principles of Macroeconomics | 4 |
| Ec 311 | Microeconomic Theory | 4 |
| Ec 415 | Microeconomic Theory with Calculus | 4 |
| Ec 312 | Macroeconomic Theory | 4 |
| Subtotal: 16 |  |  |
| One of the following |  |  |
| Ec 456 | American Economic History: the First Century | 4 |
| Ec 457 | American Economic History: the 20th Century | 4 |
| Ec 460 | History of Economic Thought | 4 |
| Ec 469 | Introductionto Econometrics | 4 |
| Subtotal: 4 |  |  |
| Economics Electives (28 credits) |  |  |
| Up to 12 credits may be belowEC 410; 16-28 credits must be numbered Ec 410 and above. |  |  |
| Ec 380 may be used to satisfy the requirement for courses numbered EC410 and above. |  |  |
| Students may not use EC415 as an economics elective. |  |  |
| Subtotal: 28 |  |  |
| Mathematics and Statistics |  |  |
| Mth 251 | Calculus I | 4 |
| Stat 243 | Introduction to Probability and Statistics I | 4 |
| Stat 244 | Introductionto Probability and Statistics II | 4 |

Subtotal: 12
Majors must take a minimum of 24 credits of upper divis ion ( 300 and above) coursework in residence from this department and must maintain at leasta 2.00 grade point average in work completed in this department.
All courses used to satis fy the departmental major requirements, whether taken in the department or elsewhere, must be taken for a letter grade and mustbe graded C-or above. Ec 403 Honors Thesis cannot be used to satisfy the requirements for the major in economics. Up to 4 credits of Ec 418 may be counted as upperdivision credit in the major.
Subtotal: 60
B.S. QUANTITATIVE ECONOMICS

## REQUIREMENTS

The B.S. in Quantitative Economics requires a total of 79 credit hours, 28 for core courses, 28 for economics electives, and 23 for math/statistics courses. The
curriculumis designed to preparestudents for entry into a Masters of Economics program, but it is also an excellent choice for those wishing to go directly into employment or a graduate programin anotherfield.

| Economics Core |  |  |
| :--- | :--- | :--- |
| Ec 201 | Principles of Microeconomics | 4 |
| Ec 202 | Principles of Macroeconomics | 4 |
| Ec 415 | Microeconomic Theory with | 4 |
|  | Calculus |  |
| Ec 312 | Macroeconomic Theory | 4 |
| Ec 380 | Introductionto Mathematical | 4 |
|  | Economics |  |
| Ec 460 | History of Economic Thought | 4 |
| Ec 469 | Introductionto Econometrics | 4 |

Subtotal: 28

## Math/Statistics

| Mth 251 | Calculus I | 4 |
| :--- | :--- | :--- |
| Mth 252 | Calculus II | 4 |
| Mth 261 | Introduction to Linear Algebra | 4 |
| Mth 254 | Calculus IV | 4 |
| Stat 451 | Applied Statistics for Engineers <br> and Scientists I | 4 |
| Stat 452 | Applied Statistics for Engineers <br> and Scientists II | 3 |

Subtotal: 23

## Economics Electives

A minimum of 28 credits of 300 - and 400 -level coursework in economics in addition to the required core courses. At least 16 of thesecredits must be in courses numbered 410 and above. Mth 311 may be counted as upper-division credit in the major. Up to 4 credits of Ec 418 may be counted as upper-division credit in the major. Ec 311 cannot be used as an economics elective.

Quantitative Economics majors musttake a minimum of 24 credits of upper-division coursework (courses numbered 300 and above) in res idence fromthis department and must maintain at least a 3.0 grade point average in work completed in this department. All courses used to satisfy the departmental major requirements, whethereconomics, mathematics or statistics, must be taken for a letter grade and must be graded C- or better. Ec 403 (Honors Thesis) cannot be used to satisfy the requirements for the BS in Quantitative Economics. Up to 4 credits of Ec 418 Economics Seminar may be counted as upper division credit in the major.

## Total Credit Hours: 79

## ECONOMICS DEPARTMENTAL HONORS PROGRAM

Departmental Honors is separate fromUrban Honors and is administrated within the Economics Department.

The Departmental Honors Programallows outstanding majors in the Department of Economics to conduct research with a faculty member and to receive recognition for their exceptional performance. Honors students participate in faculty research projects or pursue an independent honors thesis under faculty guidance. Applicants are required to have earned a minimum GPA of 3.50 in economics courses at the time of application.

To earn Departmental Honors, interested students should apply to the undergraduate advisor after completing Ec 201, Ec 202, Ec 311 or Ec 415, and Ec 312. It is recommended that students either complete Mth 251, Stat 243, Stat 244 and one of the following: Ec 456, Ec 457, Ec 460, Ec 469 OR that they enroll concurrently in these courses while working on the Departmental Honors program. Students admitted to the Departmental Honors complete the following requirements:

- 8 credits of Ec 403 which cannot be used to satisfy the requirements for the $\mathrm{BA} / \mathrm{BS}$ in economics.
- A written thesis to be completed during the final term of enrollment in Ec 403.
- Presentation of the thesis during the final termof enrollment in Ec 403 fulfills the requirements for DepartmentalHonors.


## ECONOMICS MINOR

Minors in Economics are only available to students majoring outside the department.

## REQUIREMENTS

Students complete 28 credits in economics ( 12 credits of which must be taken in residence at PSU), to include the following:

## Courses

| Ec 201 | Principles of Microeconomics | 4 |
| :--- | :--- | ---: |
| Ec 202 | Principles of Macroeconomics | 4 |
|  | Upper-division economics | 20 |
|  | electives |  |
| Courses must be taken for a letter grade and must be |  |  |
| graded C-or above. |  |  |
| Subtotal:28 |  |  |

INTERNATIONAL ECONOMICS MINOR

## REQUIREMENTS

Students complete 28 credits in economics ( 12 credits of which must be taken in residence at PSU), to include the following:

| Courses | (16 credits) |  |
| :--- | :--- | :--- |
| Ec 201 | Principles of Microeconomics | 4 |
| Ec 202 | Principles of Macroeconomics | 4 |
| Ec 340 | International Economics | 4 |
| Ec 350U | Economics of Developing | 4 |
|  | Countries |  |


| Subtotal: 16 |  |  |
| :---: | :---: | :---: |
| Upper-division economics electives chosen from: (12 credits) |  |  |
| Ec 440 | International Trade Theory and Policy | 4 |
| Ec 441 | International Monetary Theory and Policy | 4 |
| Ec 442 | The Multinational Enterprise in the World Economy | 4 |
| Ec 445 | Comparative Economic Systems | 4 |
| Ec 447 | Economics of Transition | 4 |
| Ec 448 | East Asian Economic | 4 |
|  | Development |  |
| Ec 450 | Economics of Development | 4 |

Subtotal: 12
Courses must be taken for a letter grade and must be graded C-or above.

POLITICAL ECONOMY MINOR

## REQUIREMENTS

Student must complete 28 credits in economics ( 12 credits of which must be taken in residence at PSU), to include the following:

## Courses

| Ec 201 | Principles of Microeconomics | 4 |
| :--- | :--- | :--- |
| Ec 202 | Principles of Macroeconomics | 4 |
| Ec 460 | History of Economic Thought | 4 |

Subtotal: 12

| Economics electives chosen from: (16 credits) |  |  |
| :--- | :--- | :--- |
| Ec 345 | Marxist Political Economy | 4 |
| Ec 417 | Women in the Economy | 4 |
| Ec 419 | Economics of Race and Ethnicity | 4 |
| Ec 445 | Comparative Economic Systems | 4 |
| Ec 446 | Institutional Economics | 4 |
| Ec 447 | Economics of Transition | 4 |
| Ec 450 | Economics of Development | 4 |

Courses must be taken for a letter grade and must be graded C -orabove.

## INSTITUTIONAL ECONOMICS UNDERGRADUATE CERTIFICATE

Institutional Economics focuses on the relationship between economic outcomes and the evolving structure and organization of society. Students completing the Certificate in Institutional Economics will deepen their understanding of how ins titutions within theeconomy contribute to economics outcomes. The Certificate in Institutional Economics programwelcomes the wis dom that (i) currently enrolled undergraduate students, (ii) postgraduate students, and (iii) members of the broader community bring to the classroom. For students who are majoring in Economics or Quantitative Economics, the certificate requires the completion of an additional 16 credits of approved elective courses (i.e. electives included in the Certificate in Institutional Economics do not count towards the Economics major.)

## Required Courses

| Ec 201 | Principles of Microeconomics | 4 |
| :--- | :--- | :--- |
| Ec 202 | Principles of Macroeconomics | 4 |
| Ec 460 | History of Economic Thought | 4 |

Subtotal: 12

## Elective Courses

Student may propose up to two alternative electives courses, inside or outside the Economics Department. Alternativeelectives will contribute to the understanding of economic institutions and meet the educational and career goals of the student.

Elective Courses not Subject to ProgramDirector Approval:
Ec 332U Economics of Environmental 4
Ec 345 Marxist Political Economy 4
Ec 350U Economics of Developing 4
Ec $417 \quad 4$
Ec 419 Economics of Race and 4
Ethnicity
Ec 442 The Multinational Enterprisein 4
the World Economy
Ec 443/ESM Global Environmental 4
443 Economics
Ec 445 Comparative Economic Systems 4
Ec 446 InstitutionalEconomics 4
Ec 447 Economics of Transition 4
Ec $448 \quad$ East Asian Economic 4

| Ec 456 | American Economic History: the <br> Ec 457 | First Century |
| :--- | :--- | :--- |
|  | American Economic History: the <br> 20th Century | 4 |
| Ec 465 | Labor Economics | 4 |

Subtotal: 16

## Total Credit Hours: 28

## Other Requirements :

- 16 of the required 28 credits must be taken in residency with the Department of Economics at Portland State University.
- All courses must be taken for a grade (not P/NP), with a grade of C - or better.
- Award of the Certificate in Institutional Economics requires a GPA in included courses of 2.00 or above.


## Graduate programs

The Department of Economics offers graduate work leading to the Master of Science and Master of Arts degrees, as well as two graduate certificates, the Graduate Certificate in Econometrics and DataAnalysis and the Graduate Certificate in Environmental and Resource Economics.

## ADMISSION REQUIREMENTS

## Master of Science or Master of Arts

Admission to the Master's programin the Department of Economics is online at www.pdx.edu/admissions/apply-to-grad-school. In addition to the University admissions requirements, department requirements are:

1. GPA Requirements: Admission to the Economics programis highly competitive and requires a minimum of a 3.00 GPA in overall undergraduate coursework.
2. Coursework: Undergraduate courses in Intermediate Microeconomics, Intermediate Macroeconomics, Statistics, Econometrics and MultivariateCalculus, as well as Linear Algebra, are required for admission.
3. Testing: The GRE is no longer required for admission. If an applicant has taken it, they have theoption to include the report in the application. However, the TOEFL or IELTS is required for University admis sion for international students, unless they have a degree from a university in Australia, English-speaking Canada, Great Britain, Ireland, New Zealand or the U.S. See University minimum TOEFL or IELTS requirements at www.pdx.edu/admissions/international/english-language-proficiency.
4. Recommendations: Three (3) letters of recommendation, at leasttwo of which must be from economics professors.
5. Statement of Purpose: Approximately 500 -word essay on goals and as pirations for entering and completing the graduate program.
6. Application/Transcripts: Transcripts fromALL other institutions (other than PSU) you have attended. If you are admitted to the program, you will need an official transcript sent directly fromyour other institutions to the Graduate School.

## ECONOMICS M.S./M.A.

The Master of Arts has the same requirements as a Master of Science, but Master of Arts has an additional requirement of a foreign language. Students must complete an eleven-coursecore requirement ( 44 credits), with 48 credits in total. Credit requirements beyond the core courses may be satisfied entirely with an economics elective course or with a combination of economics seminar for a maximum of 4 credits andeconomics research for a maximum of 4 credits. Students havefour options for completing the economics electives and/or research requirement:

1. Select 4 credits of economics electives
2. Select economics research to be completed in Ec 501 for a maximum of 4 credits
3. Select 1 credit ofeconomics seminar in Ec 518 for a maximum of 4 times (maximum 4 credits)
4. Select a combination of economics research and economics seminar, for a total of 4 credits

Economics elective courses may be substituted by graduate courses fromother departments with prior Departmentof Economics approval.

## REQUIREMENTS

## Core economics courses ( 44 credits)

Ec 570 Econometrics 4
Ec 571 Advanced Econometrics 4
Ec 575 Applied Advanced Econometrics 4
Ec 576 Implementing Econometrics 4
Ec 580 Mathematical Economics 4
Ec 581 Advanced Microeconomics 4
Ec 584 Applications of Advanced 4
Ec 590 Advanced Macroeconomics 4
Ec 592 Applications of Advanced 4
Ec 596 Research ProjectI 4
Ec 597 Research Project II 4

## Economics electives and/or Economics Research (4 credits)

Option I: Economics Electives
Option II: Economics Research (Ec 501)
Option III: Economics Seminar (Ec 518)
Option III: A combination of Economics Research (Ec 501) and Economics Seminar (Ec 518)

Students with questions concerning transferred credits should contact the Graduate adviser.

## ECONOMETRIC AND DATA ANALYSIS GRADUATE CERTIFICATE

The Graduate Certificate in Econometric andData Analysis consists of four 4-credit courses for a total of 16 credits. There are three required courses and one elective course. The curriculumis designed to allow students to complete the certificate in one academic year.

## REQUIREMENTS

| Econometrics Core Sequence |  |  |
| :--- | :--- | :--- |
| Ec 570 | Econometrics | 4 |
| Ec 571 | Advanced Econometrics | 4 |
| Ec 576 | Implementing Econometrics | 4 |
|  | using Stata and R |  |

Note: Ec 570 is a prerequisite for Ec 571 . However, Ec 576 can be taken out of sequence.

## Elective Course

Any graduate course numbered Ec 511 and above may satisfy the elective requirement. Elective courses should be selected in consultation with the Graduate Program Director as advance approval may be required.

## GRADUATE CERTIFICATE IN ENVIRONMENTAL AND RESOURCE ECONOMICS (G.C.E.R.E.)

The Graduate Certificate in Environmental and Resource Economics requires 16 credits of graduate coursework. The certificate provides students with an understanding of the critical linkages between economics and key environmental issues. It also offers an introduction to the most important analytical tools, including cost-benefit analys is. Students will develop a solid understanding of the major local, national and global environmental challenges, provide insights into how markets allocate natural resources and the market and government "failures" associated with the environment and will be introduced to some of the tools used to analyze theeffects of alternative resource and environmental regulations and policies.

## REQUIREMENTS

Prerequisite economics course ( 4 credits)
Ec 201 Principles of Microeconomics
4
Core economics courses ( 12 credits)
Ec 522 Economics of Sustainability
Theory and Practice
Ec 527
Cost-Benefit Analysis
Ec 530 Resource and Environmental 4
Economics
Subtotal: 12

## Graduate Elective course ( $\mathbf{4}$ credits)

Any graduate Economics course numbered 511/611 or above is automatically approved as an
elective. Appropriate courses fromother departments can be applied to the electives requirement with advance approval of the Graduate ProgramDirector.

## Economics Courses

Ec graduatelevelelective
Though any Economics course fulfills the elective requirement, the following environmental and resource economics courses may be offered:

- Ec 532 AdvancedEnvironmentalEconomics
- Ec 533 Resource Economics
- Ec 534 Business Environmental Management
- Ec 537 Public Utility Economics
- Ec 543 Global Environmental Economics


## Other Courses

Other graduate levelelective
Courses fromother departments can be applied to the electives requirements with prior approval of the Graduate ProgramDirector.
Subtotal: 16
Total Credit Hours: 16

## SUSTAINABILITY GRADUATE CERTIFICATE

The Graduate Certificate in Sustainability provides students with an in-depth understanding of sustainability and the connections between social, environmental, and economic systems, and equips themwith the knowledgeto apply sustainable, integrated problemsolving approaches in their lives and careers. The certificate is a $22-$
credit programthat consists of four core courses and two electives. The certificate is open to students fromall areas of study and professionalbackgrounds and can be taken either by students admitted solely to thecertificate programor concurrently enrolled in masters and doctoral programs at PSU. More information about the certificate and application process can be found
at https://www.pdx.edu/economics/academics/programs/gr aduate/sustainability-graduate-certificate.

## Electives

The Graduate Certificate in Sustainability requires a minimum of 7 credits of elective courses. Mostgraduate courses with a focus on sustainability or environmental is sues will count as electives. For a list of pre approved electives see the GraduateCertificate in Sustainability website. Classes not on that list should be selected in consultation with the Graduate ProgramDirector as advance approval may be required.

| Core |  |  |
| :---: | :---: | :---: |
| Ec 522 | Economics of Sustainability: | 4 |
|  | Theory and Practice |  |
| ESM 588 | EnvironmentalSustainability | 4 |
| Soc 588 | SocialSustainability Theory and | 4 |
|  | Practice |  |
| USP 588 | Sustainable Development | 3 |
|  | Practices |  |

Subtotal: 15
Note: The core clas ses can be taken in any sequenceand can also be taken after theelective courses.

Total CreditHours: 22

Combined Undergraduate and Graduate Degree
BS/BA IN MATHEMATICS + MS IN ECONOMICS

## ADMISSIONS CRITERIA AND PROCESS

- PSU undergraduate students of Mathematics shall be required to meet with their advisor by theend of their second year to map out the required coursework to apply for the MS degree in Economics. Typically, students will apply to the B+M programin their junior year, and after junior year completion, they will apply for the Masters programin theirsenior year.
- Students are strongly encouraged to meet with the Graduate Chair of Economics before applying
- Applicants will still have to apply for the MS degree programin Economics online. If the application is successful, the student will be notified by the Graduate School. Provided they satisfy the GPA requirements outlined below, they do not have to submit a statement of purpose or letters of recommendation. The GRE is no longer required for admis sion to the Masters program.
- The student should completetheir degree in Mathematics or, at the minimum, all the courses required up to the winter termof the fourth year of their study schedule.
- A GPA of 3.4 or above is required for all Mathematics and Statistics classes taken prior to entry into the MS programin Economics.
- All courses numbered 500 and above taken prior to entry into the Master's degree programin Economics must receive a grade of B or better. All undergraduate classes mustreceive a grade of C- or better. No P/NP credit will be accepted for either program.
- The PSU institutional requirement for residency for the undergraduate programis that 45 of the last 60 credits must be taken in residence at PSU. All MS level classes must be taken at PSU.

In order to facilitate a Fall term start to the Master's in Economics program, students may join the MS track with at least 140 credits completed towards the BA/BS in Math. All coursework up to the fourth year of the BA/BS in Math must be completed.

## CONTINUATION CRITERIA

Students must maintain GPA of:

- 3.3 in courses numbered 500 and above, with a minimum grade of $B$
- 3.5 in economics courses numbered 499 and below, with a minimum grade of C -
- 3.3 overallat PSU


## B.S. IN QUANTITATIVE ECONOMICS+MASTER OF SCIENCE (B.S.Q.E.+M.S.)

Students in the B.S. in Quantitative Economics program may be admitted directly into the M.S. in Economics programand "share" 16 credits of graduate level credit with the B.S.Q.E. and M.S. in Economics.

## CONTINUATION CRITERIA

Students must maintain GPAs of:
3.3 in courses numbered 500 and above, with a minimum grade of $B$
3.5 in economics courses numbered 499 and below, with a minimum grade of C -
3.3 overall at PSU.

ADMISSIONS CRITERIA

- BSQE majors may apply for the BSQE + MS program upon earning junior status if on track to complete at least 165 undergraduate credits before starting the Master's theory sequence in Fall Term. Please see the BSQE+MS section of our website, pdx.edu/economics
- Candidates for the BS + MS programshould apply online using the BSQE+MS program, not the MS program, by submitting a graduate application through the Graduate School. Before beginning the application process, students are strongly encouraged to contact the graduate advisor.
- If the application is successful, the student will be notified via e-mail.
- Applicants will not be required to submit GRE scores provided they satisfy the following requirements:
- A GPA of 3.5 or above for all economics classes
- A PSU institutional GPA of 3.3.
- 500-level courses must be graded B or better.
- All undergraduate economics courses mustbe graded C- orbetter.
- No P/NP credit in required economics, mathematics and statistics clas ses except as exempted by COVID-19 policy.
- Department residency requirement of 24 undergraduate economics credits taken at PSU satis fied.
- PSU residency requirement for 45 of last 60 credits taken at PSU satisfied


## Please Note:

The Department of Economics awards Graduate Assistantships (GAs) on a competitive basis each year. BS + MS students who meet the admission criteria and who wish to apply for a GA-ship must submit their application by February $1^{\text {st }}$ of the year they graduate with a BSQE. A neces sary but not sufficient condition for GAs is that applicants must formally obtain their undergraduate degree, before they can be considered eligible to receive GAs. Therefore, students are welcome to submit their application for the graduate programwhen their status is undergraduate, however, they must have obtained their undergraduate degree to be eligible to receiveGAs.

## RESEARCH CENTER

## Northwest Economic Research Center

## 450 Urban Center Building (URBN)

503-725-8167
https://www.pdx.edu/economics/northwest-economic-research-center

The Northwest Economic Research Center (NERC) has dual functions. First, the Center conducts applied economic research and presents it in a form that is useful and understandable to a wide variety of interested parties and stakeholders. NERC is able to fulfill a need for quality, unbiased analysis on policies and phenomena with economic implications for Oregon, and is the only economic research center partnered with a university in the Portland area.

Secondly, by using connections to other centers and departments within the University, NERC offers a wider breadth in approach in comparis on to similar non-academic centers and can engage in collaborative work outside of the discipline. In the process, NERC provides valuable experience and training fromexperts in the field to recently-graduated researchers, as well as training for graduate students currently in the M.S. programthat will be highly applicable in their future careers.

NERC offers superior value to its clients by combining the latest in analytic techniques fromthe academic world with practical, implementable recommendations, and to the community by providing vital and unbiased research. Additionally, NERC provides value to the university through opportunities for real-world experience and networking to graduate students, as well as raising awareness of the University in the popular press and other circles.

## International and Global Studies

470 Urban Center (URBN)
503-725-3455
www.pdx.edu/global-studies/

- B.A. in International \& Global Studies: Global Studies
- B.A. in International \& Global Studies: International DevelopmentStudies
- B.A. in International \& Global Studies: Asian Studies
- B.A. in International \& Global Studies: Latin American Studies
- B.A. in International \& Global Studies: African Studies (Admission to the program is currently suspended)
- B.A. in International \& Global Studies: European Studies (Admission to the program is currently suspended)
- B.A. in International \& Global Studies: Middle East Studies (Admission to the program is currently suspended)
- Minor in International and Global Studies
- Certificate in African Studies
- Certificate in Asian Studies
- Certificate in European Studies
- Certificate in Global Studies
- Certificate in International DevelopmentStudies
- Certificate in Latin American Studies
- Certificate in Middle East Studies
- Certificate in Contemporary Turkish Studies (Admission to the program is currently suspended)

The Department of International and GlobalStudies endeavors to foster a deep understanding of global is sues, such as social justice and human rights, international development, environmental justice, health, international conflicts, gender and sexuality, and labor rights. We offer fourB.A. concentrations: two thematic, interdis ciplinary options, in Global Studies and International Development Studies, and two with regional specialization, in Asian Studies andLatin American Studies. The department also offers a minor and seven undergraduatecertificates designed to add a global dimens ion to any degree. Our programs offer an excellent foundation for careers in which an understanding of global economic, political, social, his torical, and cultural processes are important. Our students have also secured admis sion to top interdisciplinary and traditional graduate programs in the US and overseas.

## DEGREE MAPS AND LEARNING OUTCOMES

To view the degree maps and expected learning outcomes for undergraduate programs offered by the Department of International \& Global Studies, go to
www.pdx.edu/academic-programs/a-z.

## ADMISSIONS REQUIREMENTS

Admis sion to the department is based on general admis sion to the University. See Admissions Requirements (p. 8) for more information.

## B.A. IN INTERNATIONAL AND GLOBAL STUDIES

You can choose fromfour B.A. concentrations: two thematic, interdisciplinary options, in GlobalStudies and International DevelopmentStudies, and two with regional specialization, in AsianStudies and Latin American Studies.

- Global Studies
- InternationalDevelopmentStudies
- Asian Studies
- Latin American Studies
- African Studies (Admission to the program is currently suspended.)
- European Studies (Admission to the program is currently suspended.)
- Middle East Studies (Admission to the program is currently suspended.)


## GLOBAL STUDIES TRACK

The Global Studies major provides both a global perspective and a deep understanding of major themes and events in global affairs. Under the guidance of expert faculty and advisors, students develop an understanding of world cultures, societies, media, and politics within the framework of globalization.

## REQUIREMENTS FOR GLOBAL STUDIES

Global Studies majors must complete sixcore courses (24 credits) ; five electives fromthe Global Studies course list ( 20 credits); and two elective courses fromthe International Development Studies course list ( 8 credits).

| Core Courses | $(\mathbf{2 4}$ credits $)$ |  |
| :--- | :--- | :--- |
| Intl 201 | Introduction to International | 4 |
|  | Studies |  |
| Int1296 | The United States and the World | 4 |
| Intl397 | Theory and Policy in <br>  <br> International Development | 4 |
| Int1407 | Seminar <br> Gnt1415 | Global Studies Theories |
| Int1470 | Intercultural Leadership and | 4 |
|  | Change <br> or | 4 |
| Intl | Understanding the International | 4 |
| $471 /$ Ling | Experience | 4 |
| 471 |  |  |

Prerequisite requirements:

- Prerequisites for Intl 397 are Intl 201 and Intl 296
- Prerequisites for Intl 407 are either Intl 397 or Intl415
- Prerequisites for Intl 415 are Intl 201 and Intl 296

Global Studies Electives ( 20 credits)
Choose five elective courses fromany upper-division Intl courses (300/400 level). Intl 399 and Intl 401-Intl 410 can only count towards Global Studies electives when approved through the Course Substitution process. See a faculty or path way advisor for more details.

Study Abroad courses can count towards GlobalStudies electives when approved through the Course Substitution process. See a faculty or pathway advis or for more details.
Additional Electives (8 credits)
Majors must take an additional eight credits of elective courses fromupper-division Intl courses, or fromthe preapproved course list; discuss the options with an International \& Global Studies advisor.

Study Abroad courses can count towards Additional Electives when approved through the Course Substitution process. See an Advisor for more details.

## Language (0-27 credits)

Two years, or equivalent proficiency, of foreign language study. Forstudents taking courses at PSU, second-year proficiency is defined by successful completion of the terminal course in the second-year language sequence, or demonstrating proficiency through the Departmentof World Languages and Literature.

## Total CreditHours: 52

Students are required to take at least 36 credits with the Intl prefix. A minimum of 12 credit hours must be Intl courses at the 400-level.

All courses used to satis fy the departmental major requirements (and minor or certificate requirements), whether taken in the department or elsewhere, mustbe graded Cor above. Courses taken under the undifferentiated grading option (pass/no pass) will not be accepted toward fulfilling department major requirements.

## INTERNATIONAL DEVELOPMENT STUDIES TRACK

A major in International Development Studies prepares students to understand the challenges that developing nations face to achieve improved living conditions for their inhabitants. In our courses, we emphasize how development is shaped by the intersections of politics, economy, social and political power, and culture at global, national, and regional levels. Our majors acquire a critical understanding of environmental vulnerabilities and socioeconomic inequalities in the developing world, grounded in an appreciation of global history.

## REQUIREMENTS FOR B.A. IN INTERNATIONAL DEVELOPMENT STUDIES

International Development Studies majors must complete six core courses ( 24 credits); five electives fromthe International Development Studies course list ( 20 credits); and two elective courses fromthe Global Studies course list (8 credits).

| Core Courses | (24 credits) |  |
| :--- | :--- | ---: |
| Intl 201 | Introduction to International | 4 |
|  | Studies | 4 |
| Intl296 | The United States and the World | 4 |
| Intl397 | Theory and Policy in | 4 |
|  | International Development | 4 |
| Intl 407 | Seminar | 4 |
| Intl415 | Global Studies Theories | 4 |
|  |  | 4 |
| Intl470 | Intercultural Leadership and | 4 |
|  | Change |  |
| Intl | or | 4 |
| $471 /$ Understanding the International | Experience | 4 |
| 471 |  |  |

Pre-requisite requirements:

- Prerequisites for Intl 397 are Intl 201 and Intl 296
- Prerequisites for Intl 407 are either Intl 397 or Intl 415
- Prerequisites for Intl 415 are Intl 201 and Intl 296


## International Development Studies Electives (20 credits)

Students must take 20 credits from the International Development Studies course list (see table below).
Intl341U Environment and Development
in Latin America
Intl343U Commodity Chains in Latin 4
America
Intl Gender and International 4
349U/WS Development
349U
Intl
Amazon Rain Forest
362U/Hst
362U
Intl 364U
Intl
372U/BSt
372U
Intl375U Global Migration 4
Intl445/USP Cities and Third World 3
445 Development
Intl460/PS Political Development in 4
$460 \quad$ Modern Turkey
Intl461/PS Politics of Economic Reform in 4
461 Modern Turkey
Intl490 Global Sustainable Development 4
Consult with an Advisor for Intl 399 and Intl 410 courses that count for International Development Studies courses. Study Abroad courses can count towards International DevelopmentStudies courses when approved through the Course Substitution process. See an Advisor for more details.

## Additional Electives (8 credits)

Majors must take an additional eight credits of elective cours es fromupper-division Intl courses, or fromthe preapproved course list ; discuss the options with an International \& Global Studies advisor.
Study Abroad courses can count towards Additional Electives when approved through the Course Substitution process. See an Advisor for more details.

## Language (0-27 credits)

Two years, or equivalent proficiency, of foreign language study. For students taking courses at PSU, second-year proficiency is defined by successful completion of the terminal course in the second-year language sequence, or demonstrating proficiency through the Departmentof World Languages and Literature.

## Total Credit Hours: 52

Students are required to take at least 36 credits with the INTL prefix. A minimum of 12 credit hours must be Intl courses at the 400-level.
All courses used to satis fy the departmental major requirements (and minoror certificate requirements), whethertaken in the department orelsewhere, mustbe graded Cor above. Courses taken under the undifferentiated grading option (pass/no pass) will not be accepted toward fulfilling department major requirements.

## ASIAN STUDIES TRACK

The Asian Studies major dives into the continent's past, present, and future through the interdisciplinary study of political-economy, cultures and religions, communication and media, gender and sexuality, migration, development, and environmental change grounded in South, Southeast, and East Asia.

## REQUIREMENTS FOR ASIAN STUDIES

Students doing the Asian Studies major must complete five core courses ( 20 credits ) and upper-division credits from PSU courses focused on Asia ( 32 credits), to include:

## Core Courses ( 20 credits)

Intl201
Introduction to International 4

Intl296 The United States and the World 4
Intl407 Seminar 4
Intl415 Global Studies Theories 4
Intl470 Intercultural Leadership and Change
or

| Intl | Understanding the International | 4 |
| :--- | :--- | :--- |
| $471 /$ Ling | Experience |  |
| 471 |  |  |

Pre-requis ite requirements:

- Prerequisites for Intl 397 are Intl 201 and Intl 296
- Prerequisites for Intl 407 are either Intl 397 or $\operatorname{Intl} 415$
- Prerequisites for Intl 415 are Intl 201 and Intl 296


## Regional Focus ( $\mathbf{3 2}$ credits)

At least 32 upper-division credits fromPSU courses focused on Asia. Students mustconsult with the faculty advisor for Asian Studies when choosing courses.
Special Topics courses $(399,410)$, Seminars (407), study abroad courses and other Asia-focused classes, as well as individualized Reading and Conference courses arranged with instructors may be substituted for specific area courses listed above. All such courses must be approved by your advisor before you register for the course.

## Language (0-27 credits)

Two years, or equivalent proficiency, of language study in one world language. For students taking courses at PSU, second-year proficiency is defined by successful completion of the terminal course in the second-year language sequence, or demonstrating proficiency through the Department of World Languages and Literature.

## Total Credit Hours: 52

For graduation, a minimum of 36 credit hours are required to be in Intl courses, of which at least 12 credit hours must be at the 400-level.
All courses used to satisfy the departmental major requirements (and minor or certificate requirements), whether taken in the department or elsewhere, must be graded Cor above. Courses taken under the undifferentiated grading option (pass/no pass) will not be accepted toward fulfilling department major requirements.

## LATIN AMERICAN STUDIES TRACK

The Latin American Studies major explores the continent's socialcontradictions, political intrigues, economic crises, and environmental diversity.

## REQUIREMENTS FOR LATIN AMERICAN STUDIES

Students doing the Latin American Studies major must complete five core courses ( 20 credits); and upper-division credits fromPSU courses focused onLatin America (32 credits), to include:

| Core Courses | ( $\mathbf{2 0}$ credits) |  |
| :--- | :--- | :--- |
| Int1201 | Introduction to International | 4 |
|  | Studies |  |
| Int1296 | The United States and the World | 4 |
| Int1407 | Seminar | 4 |
| Int1415 | Global Studies Theories | 4 |
| Int1470 | Intercultural Leadership and | 4 |
|  | Change <br> or |  |
| Int1 | Understanding the International | 4 |
| $471 /$ Ling | Experience |  |
| 471 |  |  |

Pre-requisite requirements:

- Prerequisites for Int1 397 are Intl 201 and Int1 296
- Prerequisites for Int1407 are either Int1 397 or Int1415
- Prerequisites for Int1415 are Intl 201 and Int1 296


## Language ( $\mathbf{0}-27$ credits)

Two years, orequivalent proficiency, of language study in a language spoken in Latin America. For students taking courses at PSU, second-year proficiency is defined by successfulcompletion of the terminalcourse in the secondyear language sequence, or demonstrating proficiency through the Department of W orld Languages and Literature.

## Regional Focus ( $\mathbf{3 2}$ credits)

At least 32 upper-division credits fromPSU courses focused on Latin America which must include either Intl 341U or Intl 342U. Students must consult with the faculty advis or for Latin American Studies when choosing courses.

SpecialTopics courses (399, 410), Seminars (407), study abroad courses and other Latin America-focused classes, as well as individualized Reading and Conference courses arranged with instructors may be substituted for specific area courses listed above. All such courses must be approved by your advis or before you register for the course.

## Total Credit Hours: 52

For graduation, a minimum of 36 credit hours are required to be in Intl courses, of which at least 12 credit hours must be at the 400 -level.

All courses used to satis fy the departmental major requirements (and minor or certificate requirements), whether taken in the departmentor elsewhere, mustbe graded Cor above. Courses taken under the undifferentiated grading option (pass/no pass) will not be accepted toward fulfilling department major requirements.

## ACADEMIC ADVISORS

Information on courses and major requirements is available from Urban and Global Affairs Path way advisors and faculty advisors. Students should see an advisor as soon as they declare their major and meet regularly with advis ors as they pursue their degree.

## Urban and Global Affairs Pathway Advisors:

See Advising website for information and to schedule appointments.

## Faculty Advisors:

Evguenia Davidova, evguenia @ pdx.edu, 503-725-8992;
Priya Kapoor, cgpk@pdx.edu, 503-725-3543;
Pronoy Rai, rai@ pdx.edu, 503-725-3451;
Leopoldo Rodriguez, leopoldo@pdx.edu, 503-725-8245;
Shawn Smallman, smallmans @pdx.edu, 503-725-9978;
Gerald Sussman, sussmang@ pdx.edu, 503-725-5176.

## MINOR IN INTERNATIONAL AND GLOBAL STUDIES

Add a globaldimension to any degree with a minor in International \& Global Studies. The minor offers students an opportunity to expand their interest in and awareness of global is sues - economic, cultural, political, environmental and social.

## REQUIREMENTS

The minor must be earned simultaneously with a B.A. or B.S. degree. Requirements for the Minor in International \& Global Studies include 28 credits of core and elective courses. Students who meet PSU's Second Language B.A./M.A. Requirement will be automatically considered as having completed four out of the 12 (university-wide) elective credits required for the minor.
Core Courses (8 credits)

| Int1201 | Introduction to International | 4 |
| :--- | :--- | :--- |
| Int1296 | Studies <br> The United States and the World | 4 |
| Intl Elective Courses (8 credits) |  |  |

Study Abroadcourses can count towards Intlelective courses when approved through the CourseSubstitution
process. See a faculty or CUPA advis or for more details.

## Additional Electives ( 12 credits)

Take three courses ( 12 credits) froma list of universitywide electives with global or area-specific content. The list is maintained and annually updated by the department; discuss the options with an International \& Global Studies advisor.

Students who meet PSU's Second Language B.A./M.A. Requirement will be automatically considered as having completed four out of the 12 university-wideelective credits required for the minor.

## Total CreditHours: 28

All courses used to satisfy the departmental minor requirements, whether taken in the department or elsewhere, must be graded Cor above. Courses taken under the undifferentiated grading option (pass/nopass) will not be accepted toward fulfilling departmentminor requirements.

## ACADEMIC ADVISORS

Information on courses and major and minor requirements is available from Urban and Global Affairs Pathway advis ors and faculty advisors. Students should see an advis or as soon as they declare their major and minor and meet regularly with advisors as they pursue their degree.

## Urban and Global Affairs Pathway Advisors:

See Advising website for information and to schedule appointments.

## Faculty Advisors:

Evguenia Davidova, evguenia@pdx.edu, 503-725-8992;
Priya Kapoor, cgpk@pdx.edu, 503-725-3543;
Pronoy Rai, rai@pdx.edu, 503-725-3451;
Leopoldo Rodriguez, leopoldo@ pdx.edu, 503-725-8245; Shawn Smallman, smallmans @pdx.edu, 503-725-9978;
Gerald Sussman, sussmang@pdx.edu, 503-725-5176.

## CERTIFICATE IN AFRICAN STUDIES

The African Studies certificate allows students to explore themes related to the continent's history, politics, people, economy, and culture froma multidisciplinary pers pective.

For the African Studies certificatestudents must take 24 credits of advisor-approved courses; discuss the options with an International \& Global Studies advisor.

Students who meet PSU's Second Language B.A./M.A. Requirement will automatically be considered as having
completed four out of 24 elective credits required for the certificates.

Study Abroad courses can count towards the Certificate when approved through the Course Substitution process. See an advisor for more details.

All courses used to satisfy the departmental certificate requirements, whether taken in the departmentor elsewhere, must be graded C or above. Courses taken under the undifferentiated grading option (pass/no pass) will not be accepted towardfulfilling departmental certificate requirements.

## CERTIFICATE IN ASIAN STUDIES

The Asian Studies certificate focuses on the interdisciplinary study of political-economy, cultures and religions, communication and media, gender and sexuality, migration, development, and environmental change in South, Southeast, and East Asia.

For the Asian Studies certificates students must take 24 credits of advisor-approved courses; discuss the options with an International \& GlobalStudies advis or.

Students who meet PSU's Second Language B.A./M.A. Requirement will automatically be considered as having completed four out of 24 elective credits required for the certificates.

Study Abroad courses can count towards the Certificate when approved through the Course Substitution process. See an advisor for more details.
All courses used to satisfy the departmental certificate requirements, whether taken in the departmentor elsewhere, must be graded C or above. Courses taken under the undifferentiated grading option (pass/no pass) will not be accepted towardfulfilling departmental certificate requirements.

## CERTIFICATE IN EUROPEAN STUDIES

The European Studies certificate allows students to explore themes related to the continent's history, politics, people, economy, and culture froma multidisciplinary perspective.

For the European Studies certificate students must take 24 credits of advisor-approved courses; discuss theoptions with an International \& GlobalStudies advis or.

Students who meet PSU's Second Language B.A./M.A. Requirement will automatically be considered as having completed four out of 24 elective credits required for the certificates.

Study Abroad courses can count towards the Certificate when approved through the Course Substitution process. See an advisor formore details.

All courses used to satisfy the departmental certificate requirements, whether taken in the departmentor elsewhere, must be graded C or above. Courses taken under the undifferentiated grading option (pass/no pass) will not be accepted towardfulfilling departmental certificate requirements.

## CERTIFICATE IN GLOBAL STUDIES

A Certificate in Global Studies may be earned simultaneously with a B.A. or B.S. degree, or post baccalaureate in any non-Intl major. The certificate offers students an opportunity to be recognized for their interest in and awareness of globalization and global studies in all of its aspects - economic, cultural, political, environmental and social.

The Certificate in Global Studies consists of 24 credits of global studies or globalization-focused coursework, including 8 credits of Intl foundational courses and 16 credits of elective coursework.

Students completing an International and Global Studies major or minor are not eligible to receive a Global Studies certificate.

## REQUIRED COURSES (8 CREDITS)

Students must take the following foundational classes. These courses introduce concepts including nationalism, globalization, colonialis $m$, imperialis $m$, etc. and explore how the world works in general economic, political, and social terms.

$$
\begin{array}{lll}
\text { Intl201 } & \text { Introduction to International } & 4 \\
\text { Intl296 } & \begin{array}{l}
\text { Studies } \\
\text { The United States and the World }
\end{array} & 4
\end{array}
$$

## ELECTIVE COURSES (16 CREDITS)

Students must select four elective upper-division global studies-oriented courses ( 16 credits) from the list of univers ity-wide electives maintained by the department.
Students who meet PSU's Second Language B.A./M.A. Requirement be automatically considered as having completed four out of 16 elective credits required for the certificate.
Study Abroad courses can count towards GlobalStudies Certificate electives when approved through the Course Substitution process. See an Advisor for more details.

Intl399 and Intl 401-Intl 410 can count towards the electives when approved through the Course Substitution process. See a faculty or pathway advis or for more details.

All courses used to satisfy the departmental certificate requirements, whether taken in the departmentor elsewhere, must be graded C or above. Courses taken under the undifferentiated grading option (pass/no pass)
will not be accepted towardfulfilling departmental certificate requirements.

## CERTIFICATE IN INTERNATIONAL DEVELOPMENT STUDIES

A Certificate in International DevelopmentStudies may be earned simultaneously with a B.A. or B.S. degree, or post baccalaureate in any non-Intl major. The certificate offers students an opportunity to enhance their knowledgeof international development and prepare for careers and graduate studies in this field.
The Certificate in International Development Studies cons ists of 24 credits including three corecourses (12 credits) and three courses ( 12 credits) of elective cours ework focused on international development.
Students completing an International and Global Studies major or minor are not eligible to receive an International Development Studies certificate.

## REQUIRED COURSES (12 CREDITS)

Students must take three core courses:

| Intl201 | Introduction to International | 4 |
| :--- | :--- | :--- |
|  | Studies |  |
| Intl296 | The United States and the World | 4 |
| Intl397 | Theory and Policy in | 4 |
|  | International Development |  |

Intl 201 and Intl 296 areprerequisites for Intl 397

## ELECTIVE COURSES (12 CREDITS)

Students must select threeelective upper-division international development studies-oriented courses (12 credits) from the permanent approved list shown below.

| Intl341U | Environment and Development <br> in Latin America <br> Commodity Chains in Latin <br> America | 4 |
| :--- | :--- | ---: |
| Intl343U | 4 |  |
| Intl | Gender and International <br> Development | 4 |
| 349U/WS | Amazon Rain Forest | 4 |
| Intl |  |  |
| 362U/Hst |  | 4 |
| 362U | Modern Brazil | 4 |
| Intl364U | Post-colonialStudies of Africa | 4 |
| Intl  <br> 372U/BSt  |  |  |
| Intl375U | Global Migration | 4 |


| Intl445/USP | Cities and Third World | 3 |
| :---: | :---: | :---: |
| 445 | Development |  |
| Intl460/PS | Political Development in | 4 |
| 460 | Modern Turkey |  |
| Intl 461/PS | Politics of Economic Reform in | 4 |
| 461 | Modern Turkey |  |
| Intl490 | Global Sustainable Development | 4 |
| BSt 467 | African Development Is sues | 4 |
| Ec 345 | Marxist Political Economy | 4 |
| Ec 350U | Economics of Developing Countries | 4 |
| Ec 443/ESM | Global Environmental | 4 |
| 443 | Economics |  |
| Ec 448 | East Asian Economic | 4 |
|  | Development |  |
| Ec 450 | Economics of Development | 4 |
| Geog 346U | World Population and Food | 4 |
|  | Supply |  |
| Geog 348U | Cultural and Political Ecology | 4 |
| PS 319U | Politics of the Environment | 4 |
| PS 373 | Violence, Rebellion, and Civil | 4 |
|  | War |  |
| PS 477 | Global Food Politics and Policy | 4 |
| USP 317U | Introduction to International | 4 |
|  | Community Development |  |

Study Abroad courses can count towards International Development Certificate Electives when approved through the Course Substitution process. See an advisorfor more details.

All courses used to satisfy the departmental certificate requirements, whether taken in the departmentor elsewhere, must be graded C or above. Courses taken under the undifferentiated grading option (pass/no pass) will not be accepted towardfulfilling departmental certificate requirements.

## CERTIFICATE IN LATIN AMERICAN STUDIES

The Latin American Studies certificate allows students to explore themes related to the continent's his tory, politics, people, economy, and culture froma multidisciplinary perspective.

For the Latin American Studies certificate students must take 24 credits of advisor-approved courses; discuss the options with an International \& Global Studies advis or.
Students who meet PSU's Second Language B.A./M.A. Requirement will automatically be considered as having completed four out of 24 elective credits required for the certificates.

Study Abroad courses can count towards the Certificate when approved through the Course Substitution process. See an advisor for more details.
All courses used to satisfy the departmental certificate requirements, whether taken in the departmentor elsewhere, must be graded C or above. Courses taken under the undifferentiated grading option (pass/no pass) will not be accepted towardfulfilling departmental certificate requirements.

## CERTIFICATE IN MIDDLE EAST STUDIES

The Middle East Studies certificate allows students to explore themes related to the continent's history, politics, people, economy, and culture from multidisciplinary perspective.

For the Middle East Studies certificate students must take 24 credits of advisor-approved courses; dis cuss the options with an International \& GlobalStudies advis or.

Students who meet PSU's Second Language B.A./M.A. Requirement will automatically be considered as having completed four out of 24 elective credits required for the certificates.

Study Abroad courses can count towards the Certificate when approved through the Course Substitution process. See an advisor for more details.
All courses used to satisfy the departmental certificate requirements, whether taken in the departmentor elsewhere, must be graded C or above. Courses taken under the undifferentiated grading option (pass/nopass) will not be accepted towardfulfilling departmental certificate requirements.

## CERTIFICATE IN CONTEMPORARY TURKISH STUDIES (NOT ACCEPTING APPLICATIONS)

Admis sion to the programis currently suspended.

## EDUCATION ABROAD

Students in International and Global Studies programs are encouraged to consider overseas study opportunities available through the Office of Education Abroad (p. 76), Karl Miller Center, Room660. However, a study abroad experience is not required.

## Mark O. Hatfield School of Government

Laurel Singer, Interim Director
720 D Urban Center
503-725-8224
www.pdx.edu/hatfield-school/

The Mark O. Hatfield School of Government is dedicated to improving governance through the integration of theory and practice. Scholarly inquiry is the foundation of the school's global programs that focus on public service, social justice, and governance.

Locally renowned, theHatfield Schoolhas also gained national prestige as one of the top 50Public Affairs graduate programs in the nation, according to the 2021 U.S. News and World Report rankings. Whether starting or advancing a career in public service, the Hatfield School has undergraduate, graduate, PhD , certificate and continuing education programs that allow students the flexibility to tailor their education to pursue their passion.
The Hatfield School is home to PSU's Political Science and Public Adminis tration departments. Although each programis distinct, their location under one roof affords students the unique opportunity for collaborative multidisciplinary study.

The Hatfield School offers both a Ph.D. programand a Master's degree with an interdisciplinary focus:

- The Public Affairs and Policy Ph.D. program(p. 406)
- The Master's in Public Policy (p. 409)

The School consists of two academic departments:

- Department of PoliticalScience (p. 426)
- Department of Public Administration (p. 433)
and six centers and institutes:
- Centerfor Public Service (p. 412)
- Centerfor Turkish Studies (p.412)
- The National Policy Consensus Center (p. 412)
- Criminal Justice Policy Research Institute (p. 412)
- The Institute for Tribal Government (p. 412)
- The Nonprofit Institute (p. 441)


## Doctoral Program

## PUBLIC AFFAIRS AND POLICY PH.D.

The Ph.D.in Public Affairs and Policy is an interdisciplinary program designed to prepare individuals to pursueresearch, teaching, advocacy, public service, and/or consulting in a variety of settings ranging from universities to policy research organizations, public agencies, and private consulting firms. The degree may be pursued on a full- or part-time basis.

The degree programis offered through a collaboration between the Departments of Public Administration and Political Science in the Hatfield School of Government.

Faculty members across theentire College of Urban and Public Affairs contribute expertise to the programas well.

The curriculumfocus is governance, the integrated study of political, administrative, and policy processes. This curriculum is taught against the backdrop of globalizing economies and political systems seeking to recognize governance in a modern world characterized by both cooperation and conflict among the public, private, and non-profit organizations.
The doctoral programin Public Affairs and Policy is designed to enable students to approach governance as an applied area of knowledge in which theory informs and is informed by real-world practice.

## DEGREE REQUIREMENTS

Award of the Ph.D. is the culmination of a sequential process of coursework, comprehen-sive examinations, and the research, writing, and defense of a doctoral dissertation. In addition to the department core coursework, each field has additional specialization requirements. The total number or credit hours required for the degree is 93 , distributed as follows:

- Core Coursework--

21 credits

- Research Methods-24 credits
- Field Electives -21 credits
- Dissertation-- 27 credits

As a cohort, first-year students take a series of sixcourses commonly referred to as "the core" and are examined on this material upon completion. During their second and third years, students complete their field and research methods coursework. The comprehensiveexam-ination that follows the satisfaction of all course requirements typically asks students to think prospectively about the application of this material to their dissertation work. After the completion and defense of a dissertation proposal, students advance to Ph.D. candidacy. The last remaining hurdle is the dissertation.

## Prerequisites

All students entering the doctoral programmust have completed a basic course in statistics either uponentering or within the first year of study. No degree credit will be awarded for this coursework.

## Credit requirements

The Ph.D. in public affairs and policy requires 66 credit hours of required and elective coursework. In addition, the studentenrolls in 27 credits for dissertation research and writing.

The credits are distributed as follows:
Core Coursework
Field Electives 21
Research Methods

Dis sertation credits
Subtotal: 93
To meet these credit requirements, relevant past academic coursework is recognized in these ways:

Up to 32 credits of coursework related to governance or research methods completed at the master's level may be counted toward the Ph.D. degree.

In addition, students with extensive academic background and/orexperience in using quantitative or qualitative research methods may substitute one or more required research methods courses with other coursework with permission of their academic adviser.
Core courses

| PAP613 | Organization Theory and <br> Behavior | 3 |
| :--- | :--- | ---: |
| PAP614 | Contemporary Governance | 3 |
| PAP616 | Policy Process | 3 |
| PS 520 | Seminar on American Political | 4 |
| PS 569 | Institutions |  |
| Comparative Political | 4 |  |
| PS 585 | Institutions | Political Theory and Governance |

Subtotal: 21

## Field Electives

Students must choose four of the following ten courses. PS 511 Advanced Overview of Political 4 Science
PS 515 Comparative Public Policy 4
PS 531 State and Local Politics 4
PS 546 National and International 4
$\begin{array}{ll} & \text { Security Policies } \\ \text { PS } 576 & \text { Politics of Inequality in the }\end{array}$
United States
PA 513 Administrative Ethics and 3
Values
PA $514 \quad$ Global Leadership and 3

Management
PA 521 History AndFoundations of the
Nonprofit Sector
PA 534 Administrative Law
3
PA 561 Intergovernmental Relations
3

And
Additional Three additional graduate-level 9-12 Field courses fromaround PSU,
Electives selected based on interest and in
consultation with their adviser
Subtotal: 21-28

## Research Methods

Coursework in research methods is normally completed concurrently with field specialization coursework.

Approved substitutes for methods coursework will be listed in the PAP Course Planner each year.

| Methods courses and credits |  |  |
| :---: | :--- | :---: |
| PAP 690 | Research Design for Politics and <br> PS 591 | Policy <br> Testing Theories in Political |
| PS 593 | Science <br> Philosophy of the Social <br> Sciences <br> Electives | 4 |

Subtotal: 24

## Dissertation Research

Students must register for a minimum of 27 credits of PAP 603 or PS 603 Dissertation to represent the work of researching and writing the doctoral dis sertation.

## Comprehensive examinations

In order to evaluate one's ability to integrate, analyze, and critique the diverse materials and ideas presented in the PAP curriculum, students are required to complete a twopart comprehensive examination. Part A of the examination (core exam) covers the 21 credit hours of foundational core courses. Part B (field exam) covers all coursework done in the student's specialization field. Part A is a written exam taken upon completion of the core coursework. Part B has written and oral components to the exam and is typically taken upon completion of all coursework.

## Dissertation requirements

The dissertation process is designed to evaluate the student's ability to successfully conduct a significant, independent applied research project. The dis sertation thes is represents the culmination of a student's doctoral studies.

## ADMISSION REQUIREMENTS

More information about the public affairs and policy Ph.D. programand all application forms are available at https://www.pdx.edu/hatfield-
school/ andhttps://cupa.pdx.edu/apply-now. Applications are accepted for fall admis sion only; the priority application deadline is December 1st and there is a late application deadline of March 30th.

Only one application will need to be submitted to apply to the PAP Program. The following materials should be submitted through the application link found on the Graduate School's website.

- Non-refundable $\$ 65$ application fee (no cash)
- One transcript fromeach post-secondary institution attended (both sides need to be uploaded)
- Statement of Financial Support andDeclaration of Finances (if International)
- International Applicants who currently reside in the United States with an F-1 or J-1 visa must fill out the SEVIS form
- Official TOEFL scores if the applicant does not speak English as a native language and has notreceived a graduate or undergraduate degree in an Englishspeaking territory
- A statement of intent up to 1,000 words. The statement should address the following: 1) Profess ional goals;2) Planned area of study (policy specialization); 3) Des ired employment sector; 4) How the degree furthers achievement of your professional goals
- A policy-oriented or academic writing sample.
- Three recommendation letters fromindividuals familiar with the applicant's academic and/or professional capabilities. Preferably, two of the three letters should be from former instructors or fromindividuals with knowledge of your professional performance and potential.
- A current resume


## INTERNATIONAL AGREEMENTS

The Hatfield School of Government is under a universitylevel memorandum of understanding with Khon Kaen University in Thailand and Cukurova University in Adana, Turkey. The Hatfield School maintains an active relationship with the College of Local Adminis tration at Khon Kaen University (COLA) and the Department of International Relations at Cukurova University and welcomes HSOG graduate students as part of these partnerships. Graduates students seeking opportunities for cours ework, research, and professional development in the context of developing areas and emerging A sia and Turkey are encouraged to contact the Director of the Hatfield School for more information.

## PROGRAM RULES

A more comprehensive set of rules governing satis factory completion of field area examinations, presentation of dissertation, and timely completion of doctoral program requirements appear in the General Handbook for the Public Affairs and Policy Doctoral Programissued to incoming students and available upon request.

## Limitation on graduate/undergraduate courses

Students in the PAP programare strongly advised to use no more than 12 credits of courses offered simultaneously at the 400- and 500-level in support of their degree programs. These courses must be an integral part of the
student's program, and courses with the same content must not be available on a purely graduate basis.

## Limitation on by-arrangement courses

Admitted Ph.D. students may utilize no more than 12 credits of Research and/or Reading and Conference credits (501/601 and 505/605). In cases where more than 12 credits are needed because of the lack of regularly scheduled classes, the student must submit a written request waiver to their adviser for approval.

## Continuous enrollment and leave of absence

All students admitted to the Ph .D. programin public affairs and policy must be continuously enrolled until graduation, except for periods in which they are absent for an approved leave. Taking a minimum 3 credits pertermduring the regular academic year will constitute continuous enrollment for students taking coursework. Taking a minimum of 1 credit of PAP 603 orPS 603 during the regular academic year will constitute continuous enrollment for students who haveadvanced to candidacy. Failure to register without an approved leave may result in termination of a student's admis sion. Students may have no more than six terms of approved leave.

## Grade requirement

A student who receives more than 9 credits of $\mathrm{C}+$ or below in all cours ework attempted after admis sion to the Ph.D. programwill be dropped from the program.

## Performance in core courses

A grade of $\mathrm{C}+$ or below received for work performed in a core course is not considered passing. A PAP doctoral student who receives a grade of $\mathrm{C}+$ or below in one of the core course offerings during fall or winter terms may not proceed to take the core courseofferings in the subsequent term until the course in which a failing grade was received has been repeated, and the failing grade is replaced with a passing grade of B - or better.

## RESEARCH AND TEACHING OPPORTUNITIES

The doctoral degree in public affairs and policy offers a limited number of research and teaching opportunities.

## Hatfield Residency Program

This program, conducted in cooperation with the Hatfield School's Center for Public Service, places qualified doctoral students in public and not-for-profit agencies as paid residents. Agency placements provide students opportunities to conduct dissertation research, gain advanced research experience, and receive assistance in financing theireducational objectives.

## Graduate research assistantships

Depending on available funds, a limited number of graduate research assistantships are available each year. Students must apply for these by February 1st of the academic year in which the as sistantships are desired. Assistantships pay tuition up to 9 credits and associated fees as well as a small additional stipend.

## Teaching opportunities

Doctoral students with an interest in developing competencies in teaching in a higher education setting are encouraged to teach prior to completing their Ph.D. programs. There are a limited number of opportunities available in this regard.

## Teaching apprenticeships with a university faculty member

These duties can include teaching one or more class ses sions, as sistance in preparing courses, and correction of examinations. Students are encouraged to consult with their faculty adviser to develop opportunities for teaching apprenticeships.

## Teaching in the University Studies Program

Advanced doctoral students may also teach in sophomore inquiry coursework sponsored by the College of Urban and Public Affairs. This coursework deals largely with citizen participation and leadership. Advanced doctoral students may also propose and teach a senior Caps tone course at the undergraduate level. These are interdisciplinary community-based courses required of all PSU seniors. These students will develop and implement strategies to deal with a community is sue in cooperation with one or more community organizations.

## Masters Programs

## MASTER OF PUBLIC POLICY

The Master of Public Policy is an interdisciplinary profes sional programdesigned to prepare individuals to be public policy professionals in the public, non-profit, and private sectors. The degree is built upon the disciplinary foundations of public policy, public administration, political science, economics, and public affairs. The degree is jointly administered by the Departments of Public Administration and Political Science.
The curriculumfocus is acts of public policy, meaning the allocation of public values by authoritative ins titutions. The curriculumis designed to respond to the need for advanced training in public policy analy sis and leadership/advocacy to succeed in today's complex policy environments. The degree may be pursued on a full-time ( 2 years) or part-time bas is. Graduates of MPP programs typically find employment in policy analysis and leadership/advocacy positions, especially in high-level
public agencies, the private sector, and the non-profit sector.

## DEGREE REQUIREMENTS

## Credit requirements

The Master of Public Policy programrequires 54 credit hours of required, elective, and professional development coursework.

The credits are distributed as follows:

> First-Year Cohort Courses

Methods Core Courses 10
Elective Core Courses 9-12
Policy Analysis or Leadership 9
Track Courses
Policy Specialization Courses 9
Summative Policy Project 3
Diversity, Equity, and Inclusion 3
Course
Subtotal: 54

## Courses andCredits

Cohort Courses

| PAP 511 | Introduction to Public Policy | 3 |
| :--- | :--- | :--- |
| PAP 533/PS | Ethics and Public Policy | 4 |
| 533 |  |  |
| PS 520 | Seminar on American Political | 4 |
|  | Institutions |  |

Methods Core Courses
PA $551 \quad$ Analytic Methods in Public 3
PA 552 Analytic Methods in Public 3
Administration II
PS 591 Testing Theories in Political Science

## Elective Core Courses

Choose 9 credits fromthe following courses:
PA $538 \quad$ Advocacy and Political
Participation by Nonprofit
Organizations
or
PAP 512 Introduction to Policy Advocacy 3
PA $554 \quad$ Policy Analysis Research 3
PA $579 \quad$ Policy Tools in Policy Design 3
PS 515 Comparative Public Policy 4
PS $576 \quad$ Politics of Inequality in the 4
USP 615 Economic Analysis of Public 4
Policy
USP 615 may be replaced by a comparable course (subject to approval by the programdirector)

## Track Courses

Students choose one of the following two tracks as part of their course s pecialization work:

1. Policy Analysis Track: Students take 9 credits of courses relating to policy analysis including research design and methods, cost-benefit analysis, forecasting, programevaluation, impact assessment, decisionmaking, systems modelling, and other subjects.
2. Policy Leadership/Advocacy Track: Students take 9 credits of courses relating to policy leadership and advocacy, including policy process, communication, legal reasoning, network-building, policy arguments, problemsolving, political feasibility, advocacy, and management.

## Policy Analysis Track

| CCJ 520 | Analysis of Crime and Justice Data | 3 |
| :---: | :---: | :---: |
| CE | Environmental Data Analy sis | 4 |
| 566/ESM |  |  |
| Comm 572 | Communication and Public | 4 |
|  | Opinion Seminar |  |
| Ec 527 | Cost-Benefit Analysis | 4 |
| Ec 528 | Project Evaluation | 4 |
| Ec 570 | Econometrics | 4 |
| Geog | Geographic Information Systems | 4 |
| 588/USP | I: Introduction |  |
| 591 |  |  |
| Geog | Geographic Information Systems | 4 |
| 592/USP | II: Advanced GIS |  |
| 592 |  |  |
| HSMP 588 | ProgramEvaluation and | 3 |
|  | Management In Health Services |  |
| PA 539 | NationalPolicy Process | 3 |
| PA 551 | Analytic Methods in Public | 3 |
|  | Administration I |  |
| PA 552 | Analytic Methods in Public | 3 |
|  | Administration II |  |
| PA 555 | ProgramEvaluation and | 3 |
|  | Management |  |
| PA 556 | Public Contract Management | 3 |
| PA 582 | Public Budgeting | 3 |
| PS 595 | Topics in Specialized Research | 4 |
|  | Methods forPolitical Science |  |
| Soc 592 | Qualitative Methods | 4 |
| Soc 597 | Applied Survey Research | 4 |
| Soc 638 | Integrating Qualitative and | 4 |
|  | Quantitative Methods |  |
| Soc 639 | Focus Groups Interviewing | 4 |
| SySc 513 | Holistic Strategies forProblem | 4 |
|  | Solving |  |
| SySc 525 | Agent Based Simulation | 4 |
| SySc 545 | Application of Data Science | 4 |
| SySc 551 | Discrete Multivariate Modeling | 4 |

SySc $552 \quad$ Game Theory 4
USP 520 Applied Demographic Methods I 4
USP 521 Applied Demographic Methods 4 II
USP 536 Policy Evaluation Methods 3
USP Geographic Information Systems 4
591/Geog I: Introduction
588
USP Geographic Information Systems 4
592/Geog II: Applications
592
USP 683

Policy Leadership/Advocacy Track
Comm 520 Political Communication 4
Comm 572 Communication and Public 4
Opinion Seminar
PA $514 \quad$ Global Leadership and 3
Management
PA 517 Leadership Developmentfor 3
PA 518 Leading Public Organizations 3
PA 519 Civic Capacity 3
PA 537 Law \& Public Policy 3
PA 538 Advocacy and Political 3
Participation by Nonprofit
Organizations
PA 539 National Policy Process 3
PA 541 SocialEntrepreneurship 3
PA 543 Creating Collaborative 3
Communities
PA 545 Organizational Development 3
PA 560 Local Government 3
PA $592 \quad$ Volunteerismand Volunteer 3
Management
PHE 517 Community Organizing 3
PS $516 \quad$ Political Parties and Elections 4
PS 517 Interest Groups 4
PS 518 Contemporary Political Protest in 4
PS $519 \quad$ Political Reform 4
PS 527 The Politics of Public Opinion 4
PS 531 State and Local Politics 4
Soc 524 Groups, Interaction and Identity 4
Soc 576 Theories of Social Change 3
SW 532 Advocacy and Empowerment 3
USP 550 Participatory Planning 3
USP 584 Negotiation in the Public Sector 4
Additional courses for either track may be approved by the programadviser.

## Specializations

Students identify a policy is sue-area or sector and take 9 credits of courses relating to that sector in order to develop policy-domain specific knowledge as well as professional networking and experiential application opportunities.

## Summative Policy Project

Students work with a single faculty member to complete a summative project, which can take one of several forms depending on the needs and interests of the student. In all cases, the project is intended as an integrative experience in which the student links their MPP work to their professional goals. The summative project could be, for instance: (1) a research-oriented report that tackles a question of policy analysis or public policy theory; or (2) a client report prepared upon completion of a short internship.

| PAP 509 | Public Policy Project <br> or |
| :--- | :--- |
| PS 509 | Public Policy Project |

## Diversity, Equity, and Inclusion

Choose a minimum of 3 credits fromthe following possible courses:

| PA 514 | Global Leadership and | 3 |
| :---: | :---: | :---: |
|  | Management |  |
| PA 523 | Nongovernmental Organizations: | 3 |
|  | Nonprofits on the W orld Stage |  |
| PA 547 | Culture, Values and Leadership | 3 |
| PA 549 | Cross-cultural Communication in the Public Sector | 3 |
| PA 593 | Civil Rights for Public Managers | 3 |
| PA 594 | Enhancing Diversity in the | 3 |
|  | W orkplace |  |
| PS 518 | Contemporary Political Protest in | 4 |
|  | America |  |
| PS 523 | Civil Liberties | 4 |
| PS 524 | Law, Politics, and Society | 4 |
| PS 525 | W omen and the Law | 4 |
| PS 571 | Gender \& Politics: A | 4 |
|  | Comparative Perspective |  |
| PS 576 | Politics of Inequality in the | 4 |
|  | United States |  |

Subtotal: 3

## Prerequisites

All students entering the Master of Public Policy program must have completed an introductory course in statistics. Students whose undergraduate degree is not in a related discipline may be asked also to complete an introductory course in public policy, public administration, or political science.

## PROGRAM RULES

A more comprehensive set of rules governing satisfactory performance in the MPP can be found in the Handbook for
the Master of Public Policy Programis sued to incoming students and available online.

## Limitation on graduate/undergraduate courses

Students in the MPP programare strongly advised to use no more than 12 credits of courses offered simultaneously at the 400- and 500-level in support of their degree programs. Thesecourses must be an integral part of the student's program, and courses with the same content must not be available on a purely graduate basis.

## Limitation on by-arrangement courses

Admitted Ph.D. students may utilize no more than 12 credits of Research and/or Reading and Conference credits (501/601 and 505/605). In cases where more than 12 credits are needed because of the lack of regularly scheduled classes, the student must submit a written request waiver to their adviser for approval.

## Continuous enrollment and leave of absence

All students admitted to the MPP programmust be continuously enrolled until graduation, except for periods in which they are absent for an approved leave. Taking a minimum 3 credits pertermduring the regular academic year will constitute continuous enrollment. Failure to register without an approved leave may result in termination of a student's admission. Students may have no more than six terms of approved leave.

## PROFESSIONAL DEVELOPMENT OPPORTUNITIES

The MPP programoffers a number of professional development opportunities outside of the curricular requirements of the program.

## Policy Competitions

Participation in national and international policy competitions is a common aspect of professional education in public policy. Each year, MPP students, under the direction of an MPP faculty member, will be able to participate in policy competitions.

## Oregon Public Policy Research Network

Through the Center for Public Service, the Hatfield School of Government is a founding member of the Oregon Public Policy Research Network. The Center and the Network engage in contract-based public policy research. Advanced MPP students will have the opportunity to work with the CPS to expand its public policy research.

## ADMISSION REQUIREMENTS

The MPP programadmits students once a year starting in the Fall Term. Only one application is required in order to apply to the Master of Public Policy program. Faculty begin reviewing applications on January 31 and
continue through early July, although applicants are encouraged to apply early in the application cycle.
The following materials should be submitted through the application link found on the Graduate School's website.

- Non-refundable $\$ 65$ application fee (no cash)
- One transcript fromeach post-secondary institution attended (both sides need to be uploaded)
- Statement of Fin ancial Support and Declaration of Finances (if International)
- International Applicants who currently reside in the United States with an F-1 or J-1 visa must fill out the SEVIS form
- Official TOEFL scores if the applicant does not speak English as a native language and has notreceived a graduate or undergraduate degree in an Englishspeaking territory
- A 500 word statement of intent. The statement should address the following: 1) Professional goals; 2) Planned area of study (policy specialization); 3) Desired employment sector; 4) How the degree furthers achievement of your professional goals
- Three recommendation letters fromindividuals familiar with the applicant's academic and/or professional capabilities. Preferably, two of the three letters should be from former instructors or fromindividuals with knowledge of your professional performance and potential.
- A current resume.


## RESEARCH CENTERS AND INSTITUTES

## Center for Public Service

570 Urban Center
503-725-8261
www.pdx.edu/cps
The Center for Public Service draws on the extensive expertise of faculty and students within the College of Urban and Public Affairs with a broad mandate to connect PSU's research capabilities and public service mis sion with real-world challenges in the public and nonprofit sectors. As part of its effort to forge productive and sustainable relationships with leaders at the local, state, federal, and international levels, the Center offers a wide range of leadership training and applied research capabilities. Located within CPS are the Nonprofit Institute (NPI) and the Institute for Tribal Government (ITG), along with a number of discrete programs such as First Stop Portland (FSP), the Executive Seminar Program(ESP), and the Initiative for Community and Dis as ter Resilience(ICDR).

In the specific area of leadership development, CPS offers a wide range of education, specialized training, and research programs that serve elected officials and public and nonprofit sector leaders throughoutthe Oregon/SW Washington area, as well as in international venues such as Vietnam, Japan, China, Korea and Thailand. These offerings include custom-designed leadership development programs forexperienced practitioners; and applied research and technical assistance across a wide range of fields including diversity and inclusion, change management, and organizational performance.

## Center for Turkish Studies

670B Urban Center
503-725-8309
www.pdx.edu/center_turkish_studies
The CenterforTurkish Studies (CTS) is located in the Mark O. Hatfield School of Government in the College of Urban and Public Affairs. The Center's faculty covers diverse academic dis ciplines and comes fromdepartments across Portland State University and otheruniversities in the US, Europe, Turkey, and North Cyprus. Our mission is to foster collaboration between PSU and universities in Turkey, eng age in academic research in social sciences and its application to policy making, organize conferences, panel discussions, and cultural activities for academic and public engagement. We are committed to providing decision-makers, academics, and the general public with innovative andobjective analyses in crucial policy is sues about Turkey-US andEU-Turkey relations. The CTS has expertise in a wide range of areas, including, but not limited to, Turkey-EU-U.S. relations, conducting the World Values Survey in Cyprus, and current developments in Turkey. In these venues, the Center forTurkish Studies enriches Portland State University's scholarly works and contributes to Portland State University's
internationalization initiative.

## National Policy Consensus Center

720 Urban Center
503-725-9077
www.pdx.edu/npcc
The National Policy Consensus Center advances the use of innovative collaborative governance methods in Oregon and nationally by providing collaboration services, univers ity courses, professional training, and research. We help people work together collaboratively to develop public policy and implement community-based solutions. NPCC provides the following services:

## Collaboration and Community Engagement Services:

We help government, nonprofits, the private sector, and communities collaborateto:

- Resolve public disputes
- Seek agreement on new public policies
- Implement community solutions collaboratively to improve local economies and quality of life
- Increase public participation that has a collective impact on public is sues

Education and Professional Training: We offer academic programs and customized professional training to prepare students and professionals to:

- Use consensus-seeking to resolve policy disputes
- Apply collaborative approaches in their current professions
- Work in the fields of conflict resolution and public engagement

Applied Research andDevelopment: We have several state and national programs that work on the ground to:

- Pilot special projects to test innovative practices in collaborative governance and public engagement
- Implement investigations and case studies to document the value and unique outcomes of collaborative governance, to identify the shortcomings of the practice and strategies toovercome those
- Work with other states to advance the use of collaborative governance approaches nation wide
- Publish collaboration resource materials


## Criminal Justice Policy Research Institute

550 Urban Center
503-725-4014
www.pdx.edu/criminology-criminal-justice/criminology-criminal-justice-research

The Criminology and Criminal Justice department houses the Criminal Justice Policy Research Institute (CJPRI), which strives to promote informed decision-making on the complex is sues related to crime prevention, crime control, and the criminal justice process. Its goal is to provide policymakers and the public with research and empirical guidance that is objective, practical, rigorous, and evidence- and theory-based to advance efficient, effective, and equitable policy and practice in the field of criminal justice. Faculty from the Criminology and Criminal Justice Department at Portland State University comprise the core research expertise of CJPRI. CJPRI researchers employ a wide variety of methodological and statistical approaches that deliver advanced analyses of important programand policy questions.
The CJPRI webpage includes links to the Institute's:

Current projects (https://www.pdx.edu/criminology-criminal-justice/current-projects);

Research faculty (https://www.pdx.edu/criminology-criminal-justice/research-faculty);
Research briefs and
papers (https://www.pdx.edu/criminology-criminal-justice/research-briefs-papers);
and Crime analysis and Crime prevention resources (https://www.pdx.edu/criminology-criminal-justice/crime-analysis-and-crime-prevention-resources).

## Institute for Tribal Government

570-K Urban Center
503-725-9000
http://www.pdx.edu/tribal-gov/
The Institute for Tribal Government, housed within the Center for Public Service, is a national leader in its field, providing elected tribal leaders with the information and leadership skills to work with tribal, state, local, and federal governments within a wide range of related policy is sues. Tribal leaders are offered programs to meet their own unique needs either with sessions at the Hatfield School or at tribal sites. Programs are available for addressing federal Indian law, tribal government duties and responsibilities, tribal and state relations, the federal legislative process, federal judicial and adminis trative procedures, and effective tribal leadership strategies. Additionally, the Institute for Tribal Government offers customized consultation and training services to agencies and org anizations interested in increasing their capacity for building strong collaborative relationships with tribes.

Certificate in Tribal Relations (CTR) Program: In addition to organization-specific training, the Institute also offers a 9-month Certificate in Tribal Relations programfrom December-August. Registration begins in August and is openuntilspots are filled. This programis designed for mid-career professionals employed by local, state, federal, and regional government agencies, nonprofit and for-profit organizations, and trade associations who work regularly with tribal nations and native communities, members of a tribal government, and other native communities interested in collaborative governance. Cohort members attend monthly class sessions on various relevant topics including three in the field learning experiences in W ashington, DC, Salem, OR, and tribal communities in order to better understand tribal policy making at multiple levels of governance.

## Nonprofit Institute

570 Urban Center
503-725-8261
http://www.pdx.edu/nonprofit-institute/

The Nonprofit Institute (NPI) operates out of the Center for Public Service in the Mark O. Hatfield School of Government. Its mission is to support the Oregon nonprofit sector so that it can fulfill its promise to bring people together to build a more just, inclusive and sustainable society. To support this mission, NPI:

- Builds the sector's capacity to organize, learn and lead;
- Strengthens and grows its networks;
- Tells the sector's story and articulates its promise;
- Advances vanguard is sues collectively and across sectors.

These goals are accomplished through a set of integrated strategies:

- Conducts primary research and collates scholarship generated by others to create a knowledge-bank that can be used to advance the organizational design, governance, and practice of nonprofit organizations. Emphasis is placed on applied research that generates knowledge of immediate relevance to address the needs and mis sions of nonprofits.
- Streng thens the capacity of non profit organizations in Oregon to eng age in culturally appropriate evidencebased evaluation and assessment practices to enhance org anizational performance and increase impact.
- Advances professionaldevelopment for members of nonprofit and community-based organizations.
- Offers high quality academic programs and learning opportunities that address a changing nonprofit landscape and shift in focus to community-building for both today's leaders and the next generation leaders in the nonprofit sector.
- Facilitates discussions and collaborations that build networks and bring people together to share knowledge, reflect on practice, and generate new ideas to engender greater collective impact. We believe that these goals strengthen civic life and participation, and collectively impact the pressing is sues of society.


## Nohad A. Toulan School of Urban Studies and Planning

350 Urban Center
503-725-4045
www.pdx.edu/usp/

- B.A., B.S.-Community Development
- Minor in Community Development
- Minor in Real Estate Development
- Minor in Sustainable UrbanDevelopment
- Graduate Certificate in Applied Social Demography
- Graduate Certificate in Energy Policy and Management
- Graduate Certificate in Real Estate Development
- Graduate Certificate in Transportation
- Graduate Certificate in Urban Design
- MRED-Master of RealEstate Development
- M.U.R.P. - Master of Urban and Regional Planning
- M.U.S. - Master of Urban Studies
- Ph.D. - Urban Studies, Urban Studies: Regional Science

The Toulan School of Urban Studies and Planning provides an interdisciplinary approach to understanding urban places. The school's programs are structured to allow students living or working in the Portland metropolitan area to take advantage of the broad range of resources available at Portland State University and in the community.
Undergraduates can major in community development or complement their bachelor's degree in another field by concurrently meeting the curricular requirements for a minor in community development, realestate development or sustainable urban development. Students interested in developing professional planning skills may pursuea Master of Urban and Regional Planning. The M.U.R.P. degree is fully accredited by the Planning Accreditation Board. Interest in developing urban research capabilities may be pursued through a Master of Urban Studies. Individuals desiring higher levels of research skills and/or academic employment may choose the Ph.D. in urban studies.

## Undergraduate programs

The Toulan School of Urban Studies and Planning offers distinctive opportunities to study community issues with a diverse faculty and student body in a nationally renowned planning school. Ourprograms are grounded in the theory and values of community development: the process of collective mobilization for social, economic, and racial justice-often at the neighborhood level. Graduates of our programs are knowledgeable about housing, community organizing, transportation, economic development, and environmentalissues. The programs provide excellent preparation for working in non-profit organizations, consulting firms, and public agencies. Common graduate school pathways include urban planning, public policy, public adminis tration, public health, social work, and socialsciences.
The front desk of the School of Urban Studies and Planning can be reached at askUSP@pdx.edu.

DEGREE MAPS AND LEARNING OUTCOMES

To view the degree maps and student learning outcomes for School of Urban Studies and Planning's undergraduate degree programs, go to www.pdx.edu/academic-programs/a-z.

## ADMISSION REQUIREMENTS

Admis sion to the undergraduate programs in the School of Urban Studies and Planning is based on general admis sion to the University. See Admis sions Requirements (p. 8) for more information.

## COMMUNITY DEVELOPMENT B.A./B.S.

The Community Development major is one of just 16 such programs nationwide, and the only one of these whose campus is located in a city's CentralBusiness District. According to the International As sociation for Community Development, CD is a "practice-based profes sion and an academic discipline that promotes participative democracy, sustainable development, rights, economic opportunity, equality and social justice, through the organization, education and empowerment of people within their communities, whether these be of locality, identity or interest, in urban and ruralsettings." PSU's curriculumis grounded in applied social science and incorporates a great deal of community-based learning. The programtakes advantage of the wealth of resources available in the Portland metropolitan area and draws from a variety of academic disciplines.

We aim to equip our students as community activists, apply ing their analytical and interpersonal skills to catalyze transformative social change. Our alumni are found in community-based organizations, think tanks, City of Portland, Portland Housing Bureau, Metro (regional government), s tate and local transportation agencies, and community-oriented financial institutions, and beyond. For more information about careers, see the Career Center's "What can I do with a degree in Community Development?" at https://www.pdx.edu/careers/what-can-i-do-degree-community-development.
To reach the CD major coordinator, contact CDmajor@pdx.edu.

## DEGREE REQUIREMENTS

In addition to the general university degree requirements, students in the Community Development major must complete 58 credits of coursework compris ing 46 credits of required courses and 12 credits of electives.

Some of these courses have prerequis ites and some are only offered once a year, so students should plan their programcarefully in collaboration with theiracademic advisor. In particular, the field experience requires independent advance planning.

Substitution of coursework is acceptable only by permission from the CD major coordinator; consult with your academic advis or before pursuing a course substitution.

## M AJOR REQUIREMENTS

## Core courses ( 12 credits)

The core introduces students to the social, political, cultural, and economic aspects of urban life as well as the practice of community development.
USP 300U Introduction to Urban Studies 4
USP 301U Introduction to Community 4 Development
USP 302 Theory and Philos ophy of Community Development

## Areas of community development ( 12 credits)

The "areas"cours es take an interdisciplinary approach to major themes in community development.

| USP 312U | Urban Housing and <br> Development | 4 |
| :--- | :--- | :--- |
| USP 313U | Urban Environmental Is sues | 4 |
| USP 316 | Community Org anizing and <br> SocialChange | 4 |

## Methods ( 16 credits)

Methods courses teach practical skills for doing community development work in the real world. They address technical skills - such as mapping and data analys is, interpersonal skills, and ethical community practice.
$\left.\begin{array}{lll}\text { USP 350U } & \text { Inclusive Engagement } & 4 \\ \text { USP 430 } & \text { Participatory Research Methods } & 4 \\ & \text { for Community Development }\end{array}\right)$

## Field Experience (6 credits)

An essential part of the major is pursuing personal interests and gaining experience in the practice of community development. Students identify a professional development opportunity-generally in partnership with community organization-where they can apply the skills they have learned in the major by participating in community capacity-building efforts. This experience should be completed neartheend of a student's academic program and the placement mustbe approved in advance.

While completing 120+hours of"field" work, students enroll in USP 460 Community Development Field Seminar. This course serves as a community of practice for emerging CD professionals. The seminar is a variablecredit course because students may complete their field
experience in one term( 6 credits of seminar) or spread it across multiple consecutive terms in one academic year (for example, take the seminar for two credits in fall, winter, and spring).

See the field experience resourcesite for more information about the process:
https://sites.google.com/pdx.edu/cdfieldexperience/home.
USP 460 Community DevelopmentField 2-6 Seminar

## Electives ( 12 credits)

Students must take 12 credits of electives, with at least 8 of these credits from courses in the School of Urban Studies and Planning (USP prefix).

Any regularly offered USP course that is 300 -level or higher can be used as an elective. Using by-arrangement and additional field experience credits would need to be approved in advance by the CD major coordinator; consult with your academic advisor.

The department also maintains a list of courses from around the university that can be used as electives. Consult with your academic advisor or the CD major coordinator about this list, or if you are interested in another non-USP course that aligns with the major's student learning outcomes. The CD programencourages students to participate in study abroad and other intercultural experiences.

## Advising

The academic advisors in the Urban, Public, and Global Affairs Pathway work with CD majors and students in other programs in the College of Urban andPublic Affairs to plan their overall academic program; students should meet with their advisor regularly to make sure they understand all their degree requirements. Students who have already completed coursework in the major before Fall 2013 should be aware that the curriculumhas changed. The academic advisor and CD major coordinator and the academic advisor can as sist with aligning the old and new courses.

The CD major coordinator oversees the CD major and has expertise in community development and related fields, including the course offerings within the School of Urban Studies and Planning (USP); contact the coordinator at CDmajor@pdx.edu. Building relationships with the major coordinator and other USP faculty members is a valuable way to get advising and mentoring in the areas of community development, urban planning, and allied fields from nationally recognized experts. Attending USP events and introducing yourself to faculty members during office hours are great ways to get started.

COMMUNITY DEVELOPMENT MINOR

## REQUIREMENTS

The minor in community development included 27 credits of coursework. Courses taken under the undifferentiated grading option (Pass/No Pass) cannot be used to fulfill CD minor requirements. All courses used to satisfy the minor requirements (and minor or certificate requirements), whether taken in the department or elsewhere, mustbe graded Cor above.

To reach the CD major coordinator, contact CDmajor@pdx.edu.

## Required Courses

USP 300U Introduction to Urban Studies 4
USP 301U Introduction to Community 4
Development
USP 302 Theory and Philosophy of
Community Development

A minimum of 15 credits of additional USP coursework must be taken. Using a study abroad experience to meet some of these electives requirementmay be possible; consult with an Ed Abroad advisor, the CD major coordinator, or your academic advisor.

## REAL ESTATE DEVELOPMENT MINOR

The development andmanagementof realestate is a vital component of the urban economy. The RealEstate Developmentminor (RE) will provide educationto students wanting to enter the industry. Minors develop skills to evaluate real estate development proposals and understand how real estate development fits intoregional planning andeconomic processes. To reach the REminor coordinator, contact REminor@pdx.edu.

## REQUIREMENTS

The Real Estate Development minor includes 19 credits of required courses and 6 credits of electives. All courses used to satisfy the minor requirements (and minor or certificate requirements), whether taken in the department or elsewhere, must be graded C- or above. The GPA for courses used to fulfill the minor requirements mustbe 3.0 or higher. Courses taken under the undifferentiated grading option (pass/no pass) will not be accepted toward fulfilling minor requirements.

## Required Courses ( 19 credits)

$\begin{array}{lll}\text { USP 311U } & \text { Introduction to Urban Planning } & 4 \\ \text { USP 312U } & \text { Urban Housing and } & 4 \\ & \text { Development } & \end{array}$

| USP 323U | Real Estate Development and Finance | 4 |
| :---: | :---: | :---: |
| USP 431/Ec | Urban Economics | 4 |
| 431/RE 431 |  |  |
| USP 438/RE | Real Estate Law | 3 |
| 438 |  |  |
| Electives (6 credits) |  |  |
| RE 410 | Property \& Asset Management | 4 |
| Fin 439 | Real Estate Valuation I | 4 |
| USP 301U | Introductionto Community | 4 |
|  | Development |  |
| USP 324U | Healthy Communities | 4 |
| USP 325U | Community and the Built | 4 |
|  | Environment |  |
| USP 326U | Neighborhood Change and Gentrification | 4 |
| USP | Population and Society | 4 |
| 419/Soc 441 |  |  |
| USP 427 | Commercial District | 3 |
|  | Revitalization |  |
| USP 451 | Community Economic | 3 |
|  | Development |  |
| USP 455 | Land Use:Legal Aspects | 3 |
| USP 468 | Oregon Land Use Law | 3 |
| USP 490 | Green Economics and | 3 |
|  | Sustainable Development |  |
| USP 496 | Affordable Housing Finance | 3 |

Total Credit Hours: 25

## SUSTAINABLE URBAN DEVELOPMENT MINOR

As population worldwidebecomes concentrated in cities and metropolitan regions, it has become imperative that urban development occur in a sustainable and resilient manner. The minor in Sustainable Urban Development will provide students with an opportunity to further their understanding of what it will take to make cities sustainable. Students who complete the minor will understand environmental, economic, and social sustainability as they relate to is sues and challenges of making places sustainable. To reach the SUD minor coordinator, contact SUDminor@pdx.edu.

## REQUIREMENTS

The minor requires a total of 24-27 credits. The GPA for courses used to fulfill the minor requirements must be 2.0 or higher. Courses taken under the undifferentiated grading option (Pass/NoPass) will not be accepted toward fulfilling minor requirements.

## Required Courses ( 15 credits)

USP 313U Urban Environmental Issues
USP 324U Healthy Communities

| USP 325U | Community and the Built <br> Environment | 4 |
| :--- | :--- | :--- |
| USP 490 | Green Economics and <br> Sustainable Development | 3 |
|  | Sust |  |

## Electives (9 credits)

Choose three courses fromthe approved list (contact your academic advis or or the SUD minor coordinator to discuss additional options, including study abroad courses).
BSt 484 African American Community 4
CE 351 Introduction to Transportation 4
Engineering
CE $371 \quad 4$
ChLa 301U Chicano/LatinoCommunities 4
CR 304U Participating in Democracy 4
Ec 332U Economics of Environmental 4
Issues
ESM 355U Understanding Environmental 4
Sustainability I
ESM 356U Understanding Environmental 4
ESM 428 Urban Ecology 4
Geog 347U Environmental Is sues and Action 4
Geog 412 Global Climate Change Science 4
and Socio-environmental Impact
Assessment
Geog 447 Urban Streams 4
Geog 462 Sense of Place 4
Hst 337U History of American Cities 4
Intl Cities and Third World
445/USP Development
445
Phl 310U EnvironmentalEthics 4
PS 319U Politics of the Environment 4
Soc 465 EnvironmentalSociology 4
USP
Population and Society 4
$\begin{array}{lll}\text { 419/Soc } 441 & & \\ \text { USP } 427 & \text { Commercial District }\end{array}$
$\begin{array}{ll}\text { USP } 427 & \begin{array}{l}\text { Commercial District } \\ \text { Revitalization }\end{array}\end{array}$
USP Cities and Third World 3
$\begin{array}{ll}\text { 445/Intl 445 } & \text { Development } \\ \text { USP 451 } & \text { Community Economic }\end{array}$

Total Credit Hours: 24

## Graduate programs

With over half of the world's population now living in urban areas, the challenge of creating and maintaining urban places as high quality, healthy, vital places for people has never been more important. Our expectation is that recipients of the graduate degrees and certificates offered by the Toulan School of Urban Studies and

Planning will be in the forefront of those efforts, contributing professionalleadership and new knowledge in support of this first "urban century".

## GRADUATE ASSISTANTSHIPS

Financial aid programs are adminis tered without regard to race, creed, national origin, handicap, marital status, or sex The school awards a signific ant number of graduate as sis tantships to qualified students. Assistantship awards are reviewed annually and can be renewed for up to two additional years. More advanced students may compete for dissertation fellowships.

## ADMISSION REQUIREMENTS

All qualified applicants receive consideration for admis sion withoutregard to sex, race, handicap, age, creed, marital status, or national origin.
In addition to the general University requirements (p. 8), requirements for applications to the ToulanSchoolof Urban Studies and Planning are outlined below and can be found at www.pdx.edu/usp/.

## Master of Real Estate Development

An essay of intent, two recommendations, a res ume, a standardized GRE or GMAT exam. MRED students are admitted for fall term only, with three application deadlines: November 1 (early admis sion), February 1 (scholarship eligibility), and April 1 (priority admission). Admis sion is handled jointly between the Schoolof Urban Studies and Planning and the School of Business Administration. Applicants should consult: www.pdx.edu/business/grad-mred-apply.

## Master of Urban and Regional Planning

A personal es say and three recommendations, on the forms provided, are required fromindividuals familiar with the student's academic or professional background. Graduate Record Examination scores are not required, but highly recommended. For the M.U.R.P. program, students are admitted for the fall term only. The deadline for fall term applications for the M.U.R.P. programis January 15.

## Master of Urban Studies

A letter of intent and three recommendations, on the forms provided, are required fromindividuals familiar with the student's academic or professional background. Graduate Record Examination scores are required. For the M.U.S. program, students are admitted fall, and winter terms. The deadline for fall term applications for the M.U.S. program is January 15.

## Doctor of Philosophy in Urban Studies

A personal es say and three recommendations, on the forms provided, are required fromindividuals familiar with the
student's academic or professional background. Graduate Record Examination scores are required. Ph.D. applicants are strongly urged to complete successfully an introductory statistics course before entering the program. Instructions for the doctoral applicant's personal es say can be found on the School website. For the doctoral program, students are admitted fall term only. The deadline for fall term applications for the Ph.D. programis January 15.

## MASTER OF REAL ESTATE DEVELOPMENT (M.R.E.D.)

The Master of RealEstate Development (MRED) is a professional degree, training students in the areas of real estate development within the context provided by principles of sustainability, social equity, and communitybased development. By its nature, real estate education is multi-disciplinary, involving finance, urban planning, architecture, law, engineering, design, apprais al, and other disciplines. To deliver this education, the MRED degree is a joint degree of the School of Business Adminis tration and the Toulan School of Urban Studies and Planning.
The objective for this programis to provide a unique and exceptional graduate degree that will enable students to assist in the development and management of property with an understanding of the role that such development plays in the context of broader community concerns and history, and in the context of the surrounding neighborhood and city. Students will work closely with high-level industry professionals in their clas ses and workshops.

The MRED degree is designed to accommodate students with a wide variety of undergraduate degrees and is best suited for students who have gained at least two years of industry experience prior to their admis sion date. The programis designed to be completed in two years on a part-time bas is or one year on a full-time bas is. Full-time students are admitted for fall term only. Students will develop their skills in three areas: sustainable urban development, finance and policy, and project development, leading to the Real Es tate Development Workshop culminating experience. The degree requirements ( p . 130) are listed in the School of Business Administration.

## MASTER OF URBAN STUDIES (M.U.S.)

The Master of Urban Studies provides training for students seeking employment in public and private urban research organizations.

The M.U.S. degree requires a total of 52 credits.M.U.S. students pursue a common core of courses dealing with the analys is of urb an phenomena ( 21 credits). Each student also defines a field area which is pursued through coursework ( 25 credits) and individual research leading to
a thes is ( 6 credits). In addition, the degree provides for a specialized option in social and policy research.

## CORE-AREA REQUIREM ENTS

The urban core-are requirements for the M.U.S. degree include the following courses:

## Courses

| USP 613 | Urban Economic and Spatial <br> Structure | 3 |
| :--- | :--- | :--- |
| USP 614 | History and Theory of Urban | 3 |
| USP 617 | Studies <br> The Sociology and Politics of | 3 |
|  | Urban Life |  |
| USP 630 | Research Design | 4 |
| USP 634 | Data Analysis I |  |
| USP 683 | Qualitative Analysis | 4 |

## FIELD-AREA REQUIREM ENTS

The student selects a pattern of coursework that equips him or her forresearch in areas of applied interest. Field areas may focus on urban aspects of social science theory in one of the fields emphasized in the urban studies Ph.D. programoron a substantive is sue of particular concern to the student. Relevantcourses are av ailable within the School of Urban Studies and Planning and in many other departments within the University. Twenty-five credits of field-area coursework are required.

## RESEARCH REQUIREMENTS

The M.U.S. degree requires registration for 6 credits of USP 503 Thes is and completion of a formal thesis.

## MASTER OF URBAN AND REGIONAL PLANNING (M.U.R.P.)

The Master of Urban and Regional Planning program prepares students forcareers that help communities to become more equitable, prosperous, sustainable and resilient. Graduates of the programacquire skills suiting themfor employment in public agencies, private firms and non-profit organizations involved in planning and urban development processes at a variety of scales. Beyond the core curriculum, the programoffers students opportunities to customize their education by designing a pathway, with their 29 elective credits, to reflect their academic and profes sional interests within planning, in areas such as: transportation, land use, community development, food systems, environment, or economic development. This degree is fully accredited by the Planning Accreditation Board.

## COURSE REQUIREMENTS

## Planning sequence

USP 540 History and Theory of Planning
USP 541 Dynamics of Planning Practice 3

| USP 550 | Participatory Planning | 3 |
| :---: | :---: | :---: |
| Methods sequence |  |  |
| USP 531 | Geographic Information Systems (GIS) for Planners | 4 |
| USP 533 | Planning Methods I | 4 |
| USP 535 | Planning Methods II | 4 |
| USP 584 | Negotiation in the Public Sector | 4 |
| Analytical methods |  |  |
| USP 515 | Economics: Applications in Urban Studies | 4 |
| USP 525 | Design Analysis in Planning | 2 |
| USP 553 | Legal Processes in Urban Planning | 1 |
| Workshops |  |  |
| USP 558 | Planning W orkshop | 9 |
|  |  | (3+6) |
| USP 559 | Internship Seminar | 1 |
|  | Pathway andElectives | 29 |

Subtotal: 72

## PLANNING WORKSHOP

Planning Workshop is the culminating experience of the MURP program, and required for all students. Students work in teams with clients fromaround the region on projects that those clients have proposed, and complete all facets of the plan-making process: scoping, research and analys is, community and stakeholder engagement, and plan development. Workshop projects are often implemented by clients to the benefit of their communities.

## FIELD PAPER/PROJECT

Students may choose to prepare an original research paper or project in their field of specialization. Theresearch paper or project is meant to demonstratea student's ability to integrate and apply materialfromhis or hercoursework and is designed in consultation with faculty.

## INTERNSHIP REQUIREMENT

MURP students are required to complete 400 hours of planning-related internships during their time in the program. Students with significant professional experience in planning or planning-related fields may obtain a waiver from this requirement, but are nonetheless required to complete USP 559 Internship Seminar.

## URBAN STUDIES PH.D.

Dynamic metropolitan regions are increasingly seen as central to economic, social, and political development throughout the world. Composed of one or more central cities, suburbs, and adjacent agricultural and natural areas, they are the es sential building blocks of the global economy and the sources of social and political innovation. Understanding metropolitan regions and their problems
and analyzing policies to shape their evolution are major concerns of the Urban Studies doctoral program. The programexplores these is sues from multi-disciplinary and interdis ciplinary points of view. Through participation in classes and seminars and supervised research and teaching activities, Ph.D. students prepare forcareers in institutions of highereducation and in research org anizations.

## CORE REQUIREMENTS

Entering students in the Ph.D. in urban studies take the following common courses:

## Courses

USP 613
Urban Economic and Spatial
USP 614 History and Theory of Urban Studies
USP 617 The Sociology and Politics of Urban Life
USP 630
Research Design
USP 634
Data Analysis I
USP 683 Qualitative Analysis
USP 697
Research Design2

The first six are normally taken in the first year, with USP 697 taken at the beginning of the second year. Students in USP 697 produce a fully developed research paper as a requirement for continuation in the program.

## FIELD AREA REQUIREMENTS

Doctoral specializations are available in the following areas of advanced interdisciplinary study: planning, community development, policy analysis, gerontology, social demography, economic development, environment and transportation.

## Planning

focuses on the development and implementation of mechanisms for org anizing social, economic, political, and environmental change at the local, state, and regional levels. The field includes study of the relationships and interactions among public and private institutions, organizations, citizens, and landscapes; the design of processes for facilitating dialogue among public actors; and the tools for planning analysis and evaluation. As a pioneer in state land use law and a place in which planning dis course is highly visible, Oreg on provides a rare vantage point for the study of planning history, planning processes and strategies, and professional practice.

## Environment

focuses on urban socio-ecological conditions and interactions in areas such as natural resource management, environmental protection and quality, ecosystemservices, food systems, and energy and climate. This includes a foundation in theory and methods that
enable: examination of the roles of institutions (both government and non-government), groups and individuals,
law and regulation, ethics and values, the market (or lack of a market); the handling of us able knowledge and scientific uncertainty; and the analysis of change in complex socio-technical-biophy sical systems.

## Community development

deals with the dynamics of neighborhood and community formation and change and with public policies that address the needs of groups and places within contemporary society. The rich civic culture of Portland and the Pacific Northwest and the region's connections to the Pacific Rim provide numerous examples for study and analysis. Within the broad field of community development, students can address such topics as ethnic and neighborhood history, housing and economic development, the roles of public and nonprofit institutions in community building, mediation and conflict resolution, changing patterns and systems of communication, and the changing meanings of place.

## Social demography

provides training in the tools of demographic analysis, with particular attention to the methods of data collection, techniques of demographic analysis, and the interpretation of research findings. Social demography involves the use of the principles and methods of demography in decisionmaking and planning problems in both public and private settings. Graduates in the field of socialdemography use demographic datato identify and analyze important population trends and their consequences for work in government agencies, research organizations, and corporations. Faculty in the area of social demography have training in demography, sociology, geography, and statistics. Faculty research includes population dis tribution and migration, international migration, fertility and family planning, marriage and divorce, public policy uses of demographic data and estimates, and demographic methods.

## Gerontology

addresses the social issues, problems, policies, and programs that affect the quality of life for our rapidly aging population. Students have the opportunity to work directly with faculty on publicly-and privately-funded research at the College's highly regarded Institute on Aging. Adult development and aging is approached froma multidisciplinary and collaborative perspective. Faculty research interests include: family caregiving and workfamily balance, social networks and widowhood, diversity in aging, long-termcare policy and programs, housing environments, development and evaluation of training for health professionals, and planning for the aging of the baby-boomgeneration and beyond. As a state with a national reputation as a leader in the development of community-based, long-termcare, Oregon provides a unique environment for the study of aging processes, policies, and services.

## Economic development

is concerned with the factors that lead to differential rates of economic development at various spatial scales: within and between nations, states, regions, cities, and neighborhoods. In analyzing these differences, is sues such as the meaning of economic development, who gains and who loses fromvarious changes, as well as analysis of policies to promote economic de velopment, are addressed. The Center for Urban Studies and Institute for Portland Metropolitan Studies offer research opportunities in this field.

## Transportation

includes planning, policy, forecasting, meas urement, and evaluation of multimodal trans portation infrastructure and systems. The multidisciplinary field covers all modes of passenger and freight transport and includes the holistic study of relationships and interactions of the transportation systems with land use, the region, the economy, the environment, institutions, the community, and people. Students can address topics such as impacts of transportation on land use and land values, the relationships between urban formand travel behavior, the costs and benefits of tran sport facilities, the operation of transportation facilities, equity impacts of transport and the effects of transportation plans and policies. There are opportunities to work on research through the Center for Urban Studies and the Center for Transportation Studies.
Each student pursues two fields of specialization, at least one of which should be chosen fromamong those listed above. A student-nominated field, developed in conjunction with School faculty, may be offered as a second specialization. Faculty groups specify field-specific course requirements, including methodology courses and courses essential to a multid is ciplinary approach. These groups work closely with students to develop coherent specializations that prepare each individual to do doctorallevel research in that field.

## URBAN STUDIES—REGIONAL SCIENCE PH.D.

Regional science brings a variety of social science perspectives to bear in analyzing the growth and development of metropolitan areas, states, and regions. The regional science program shares the same core requirements as the Urban Studies Ph.D. Beyond these, students in regional science design a programof study around two field areas.
The only required course in the second field is USP 691 Current Research in Regional Science. Subject to prior faculty group approval, students may organize second field areas around a topic other than the four identified above. It is recommended that the second field include additional methods courses that support the field's topical focus. For
example, in the trans portation field area the supporting methods courses might include coverage of demand modeling, cost-benefit analy sis, GIS, and spatial analysis.
Students in the regional science programmust pass a comprehensive examination in their two field areas. This is a single examination, developed in consultation with two members of the regionalscience faculty group.

## PROGRAM RULES

## Advanced standing in Urban Studies and Planning graduate program

A total of 72 credits in nondissertation graduate training is required of all Ph.D. students. Ph.D. students are also required to take a minimum of 27 dissertation credits. For students with a master's degree in a related discipline, a maximum of 24 advanced standing credits may be requested. All such requests must be accompanied by a listing of previous graduate work for which advanced standing is sought.

The Master of Urban Studies programrequires a minimum of 52 credits in graduate courses, of which at least 36 must be taken at Portland State University. A maximum of 17 credits of advanced standing credit may be requested. The Master of Urban and Regional Planning programrequires a minimum of 72 credits in graduate courses of which at least 48 must be taken at Portland State University. A maximum of 24 credits of advanced standing credit may be requested.
A M.U.R.P. student may request advanced standing for the 1-credit USP 559 Planning Practice Workshop. If advanced standing credit is approved, the student is cons idered to have fulfilled the internship requirement. Such advanced standing credit will be included in the 24credit maximum for all advanced standing; only professional work completed within seven years of the date the degree is granted canbe included.

Requirements with regard to both the pattern of coursework and total credits must be satisfied prior to either advancement tocandidacy in the Ph.D. programor graduation in the M.U.S. and M.U.R.P. programs. A student is not obligated to enroll in a required course if that student has already acquired knowledge of the subject matter through earlier graduate coursework. In such cases, the student may requestexemption from the course. Permission is granted only after obtaining written verification fromthe instructor that the student has met the requirements of the required course. All such requests should be made within one year after entrance to the program.

## Limitation on graduate/undergraduate courses

Students in the M.U.R.P., M.U.S., and Ph.D. programs are strongly advised to use no more than 12 credits of courses
offered simultaneously at the 400-and 500-level in support of their degree programs. Courses must be an integral part of the student's programand courses with the same content must not be available on a purely graduate basis.

## Limitation on by-arrangement courses

Admitted Ph.D. and master's students may utilize no more than 12 credits of by-arrangement classes (501/601 and $505 / 605)$. In cases where more than 12 credits are needed because of the lack of regularly scheduled clas ses, a waiver must be submitted for approval by the school Curriculum Committee and by the school director.

## Continuous enrollment

All students admitted to the M.U.R.P., M.U.S., and Ph.D. programs in urban studies must be continuously enrolled until graduation, except for periods in which they are absent by approved leave. Taking 1 credit per term during the regular academic year will constitute continuous enrollment. Failure to register without an approved leave may result in termination of student admission.

## Grade requirement

A student who receives 9 credits of grades below $B$ - in all coursework attempted after admis sion to an urban studies graduate degree program will be dropped fromthat program. A student attempting both a master's and a Ph.D. degree in urban studies may receive no more than 9 credits below B- in both programs. MURP students must receive grades of at least B - in all core courses.

## Graduate Certificates

Graduate certificates in applied social demography, energy policy and management, real estate development, trans portation, and urban design are offered by the Toulan School of Urban Studies and Planning. Admis sion to these programs require an undergraduate degree at an accredited university and a GPA that meets university graduate admis sion requirements.

## AFFORDABLE HOUSING DEVELOPMENT

## REQUIRED COURSES

| Required Courses |  |  |
| :--- | :--- | :--- |
| RE 521 | Real Estate FinanceI | 4 |
| USP 523 | Real Estate DevelopmentI | 4 |
| USP 561 | Affordable Housing | 5 |
|  | Development Workshop |  |
| USP 596 | Affordable Housing Finance |  |

## ELECTIVES

| USP 554 | Planning and Housing Markets | 3 |
| :--- | :--- | :--- |
| USP 567 | Urban Housing Policies | 3 |
| USP 585 | Housing Environments for Older | 3 |
|  | Adults |  |

Subtotal: 3-4
APPLIED SOCIAL DEMOGRAPHY GRADUATE CERTIFICATE

CORE

| USP | Population and Society | 4 |
| :--- | :--- | :--- |
| 519/Soc 541 |  |  |
| USP 520 | Applied Demographic Methods I | 4 |
| USP 522 | Practicumin Applied <br> Demography |  |

## FOCAL AREA

Choose one elective fromthe list below:

| Age 516 | Families and Aging | 4 |
| :---: | :---: | :---: |
| Age 558 | Perspectives on Aging | 3 |
| Age 562 | Global Aging | 3 |
| Ec 550 | Economics of Development | 4 |
| Epi 512 | Epidemiology I | 4 |
| PHE 522 | Health and Social Inequalities | 3 |
| PHE 546 | Urban and Community Health | 3 |
| Soc 569 | Sociology of Aging | 4 |
| Soc 585 | MedicalSociology | 4 |
| USP 515 | Economics: Applications in Urban Studies | 4 |
| USP 521 | Applied Demographic Methods II | 4 |
| USP 523 | Real Estate DevelopmentI | 4 |
| USP 526 | NeighborhoodConservation and Change | 4 |
| USP 544 | Urban Transportation Planning | 3 |
| USP 572 | Regional Economic | 3 |
|  | Development |  |
| USP 573/RE | Real Estate Economics | 4 |
| 573 |  |  |
| USP 615 | Economic Analysis of Public Policy | 4 |

Subtotal: 12

| Choose one of the following: |  |  |
| :--- | :--- | :--- |
| USP 526 | Neighborhood Conservation and | 4 |
|  | Change |  |

## PROFESSIONAL METHODS

Choose one elective from the list below:

Geog Geographic Information Systems 4 588/USP I: Introduction

4

Subtotal: 4

## Subtotal: 16

591

| Geog | Geographic Information Systems | 4 |
| :---: | :---: | :---: |
| 592/USP | II: Advanced GIS |  |
| 592 |  |  |
| Geog 596 | Introductionto Spatial | 4 |
|  | Quantitative Analysis |  |
| Geog 597 | Advanced SpatialQuantitative | 4 |
|  | Analysis |  |
| PHE 521 | Quantitative Research Design and Analysis | 3 |
| Soc 593 | Quantitative Methods | 4 |
| USP 531 | Geographic Information Systems | 4 |
|  | (GIS) for Planners |  |
| USP 543 | Geographic Applications to | 4 |
|  | Planning |  |
| USP 634 | Data Analysis I | 4 |
| USP 654 | Data Analysis II | 4 |

Subtotal: 4
Total CreditHours: 20
ENERGY POLICY MANAGEMENT GRADUATE CERTIFICATE

## REQUIREMENTS

## Focus Area

| Choose two courses: |  |  |
| :--- | :--- | :--- |
| Ec 537 | Public Utility Economics | 4 |
| Ec 538 | Energy Economics | 4 |
| Ec 544 | Economics of Green Power | 4 |
| ETM 568 | Energy Technology Innovations | 4 |
| PA 572 | Columbia River Basin | 3 |
|  | Governance |  |
| PA 573 | Smart Grid and Sustainable | 3 |
|  | Communities: Making the Smart |  |
| USP 518 | Grid Work |  |
| USP 569 | Energy and Society | 3 |
| USP 574 | Sustainable Cities and Regions | 3 |
|  | Socio-Technical Change in the | 4 |
| USP 582 | City |  |
| USP 625 | Sustainable Transportation | 3 |
|  | Green Buildings II | 3 |

## Professional Skills

Choose two courses:
Ec 526 Economics of Regulation 4
Ec 527 Cost-Benefit Analysis 4
Ec 530 Resource and Environmental 4
Ec 570 Econometrics 4
Ec 571 Advanced Econometrics 4
Ec 572 Time Series Analysis and 4
Ec 575 Applied AdvancedEconometrics 4
ETM 525 Strategic Planning 4

| ETM 530 | Decision Making | 4 |
| :---: | :---: | :---: |
| ETM 531 | Technology Assessment \& | 4 |
|  | Acquisition |  |
| ETM 534 | Technology Roadmapping | 4 |
| ETM 540 | Operations Research | 4 |
| ETM 545 | Project Management | 4 |
| PA 536 | Strategic Planning | 3 |
| PA 550 | Managing Information Resources | 3 |
| PA 554 | Policy Analysis Research | 3 |
| PA 555 | ProgramEvaluation and | 3 |
|  | Management |  |
| PA 556 | Public Contract Management | 3 |
| PA 557 | Operations Research in Public | 3 |
|  | Administration |  |
| PA 558 | Managing Public Projects and | 3 |
|  | Programs:From Localto Global |  |
| SySc 514 | SystemDynamics | 4 |
| SySc 525 | Agent Based Simulation | 4 |
| USP 532 | Data Collection | 4 |
| USP 536 | Policy Evaluation Methods | 3 |
| USP 578 | Impact Assessment | 3 |
| USP 588 | Sustainable Development | 3 |
|  | Practices |  |
| USP 615 | Economic Analysis of Public | 4 |
|  | Policy |  |
| USP 634 | Data Analysis I | 4 |
| Core |  |  |
| PA 567 | Energy Resources Policy and | 3 |
|  | Administration |  |
|  | or |  |
| USP 534 | Green Buildings | 3 |

Total Credit Hours: 15

## GERONTOLOGY GRADUATE CERTIFICATE

The Graduate Certificate in Gerontology provides multidisciplinary specialized training for postbaccalaureate and graduate students interested in acquiring or upgrading skills appropriate to working with or on behalf of older adults in a variety of settings. Students need not be enrolled in a degree programto receive the Graduate Certificate in Gerontology.

Website: www.pdx.edu/ioa/graduate-certificate-ingerontology

The certificate programconsists of a six-course format (18 credits minimum) made up of a three-course multidisciplinary core, two elective courses, and an internship or independent research project. The coursework will provide students with a general multidisciplinary overview of the field of aging, while the internship or independent project will allow a student to acquire experiential learning in a community-based aging services org anization.

## COURSE REQUIREM ENTS FOR THE GRADUATE CERTIFICATE PROGRAM:

## Three required classes

| Age 556 | Health Aspects of Aging |
| :---: | :---: |
| Age 558 | Perspectives on Aging |
| Psy 562 | Psychology of Adult Development and Aging |
| Soc 569 | or Sociology of Aging |

For MSW students the three (3) required courses are:
Age 558 Perspectives on Aging 3
SW 544 Mid-Life and Beyond 3
SW 574 Social Work with Older Adults 3

## InternshipRequirements

In addition, students are expected to undertake either an internship in an aging-services programor an independent research project; this typically takes place during the last term of certificate work.

| Age 501 | Research | $1-3$ |
| :--- | :--- | :--- |
| Age 504 | Cooperative Education/Internship | $1-3$ |

## Electives

Two electives are required for ALLstudents from the following, or other aging-specific courses, as available.

A good rule of thumb in determining if a course is agingspecific, is if aging, elderly, lifecourse or older adult are in the title.

| Age 516 | Families and Aging | 4 |
| :--- | :--- | :--- |
| Age 523 | Business and Aging | 4 |
| Age 557 | National Long-termCare Policy | 3 |
| Age 556 | Health Aspects of Aging | 4 |
| Age 559 | Economics of Aging | 3 |
| Age 560 | MentalHealth and Aging | 3 |
| PHE 561 | Cultural Variations in Aging | 3 |
| Age 562 | Global Aging | 3 |
| Age 563 | Service Learning in Nicaragua: | 3 |
|  | Enhancing Communities for an |  |
| Soc 566 | Aging Society |  |
| SW 544 | Sociology of Dying and Death | 4 |
| SW 569 | SocialWork in End-of-Life and <br>  <br> SW 574 | Palliative Care |
| USP 564 | Social Work with Older Adults | 3 |
|  | Political and Administrative | 3 |
| USP 585 | Issues in Aging | 3 |
|  | Housing Environments for Older | 3 |
|  | Adults |  |

Note: Age 556 is an elective option forMSW students only.

There may be other approved clas ses - they will be listed on the web each quarter at www.pdx.edu/ioa/classschedule

Students may selectonly one 510 course per certificate program. 510 courses may be used only as electives.
Total Credit Hours: 18
Graduate students in other programs, such as Urban Studies, Urban \& Regional Planning, Public Adminis tration: Health Adminis tration, and Public Policy, can also specialize in gerontology with the right plan and academic advising.

## REAL ESTATE DEVELOPMENT GRADUATE CERTIFICATE

Dramatic changes in the real estate industry over the past decade require an advanced set of interdis ciplinary skills for commercial and residential realestate practitioners in the private, public, and non-profit sectors. The Graduate Certificate in Real Estate Development has been designed to build the technical and analytical knowledge of those who wish to enter the industry or to further develop the skills of industry professionals.
Courses within the Certificate programare taught by faculty fromthe Toulan School of Urban Studies and Planning, and TheSchool of Business. Clas ses combine theoretical, empirical, and case studies methods, and involve as sistance fromPortland metropolitan area real estate industry professionals. All required classes are taught during evening hours to accommodate the needs of working profes sionals, as well as full-time students.
The Graduate Certificate in RealEstate Development is a 24 -credit program, 15 of which are Core Courses and 9 of which are Electives.

## CORE COURSES

| RE 521 | Real Estate Finance I | 4 |
| :--- | :--- | :--- |
| USP 523 | Real Estate Development I | 4 |
| USP 546 | Real Estate DevelopmentII | 3 |
| USP 612 | Community, Planning, and | 4 |
|  | Ethics |  |

*Students co-enrolled in the Master of Urban and Regional
Planning (MURP) programmay substitute USP 540
History and Theory of Urban Planning for USP 612
Community, Planning, and Ethics.

## ELECTIVES

Choose at least one course from Group 1. Additional electives can come from Group 1 or Group 2.

## Group 1

| USP 579 | State and Local Public Finance | 3 |
| :---: | :---: | :---: |
| USP 596 | Affordable Housing Finance | 3 |
| Group 2 |  |  |
| USP 510 | Housing Planning and | 3 |
|  | Development |  |
| USP 510 | International Planning \& Real | 3 |
|  | Estate |  |
| USP 510 | Retrofitting Suburbia | 3 |
| USP 517 | Urban Economic Development | 3 |
|  | Policy |  |
| USP 524 | Site Planning | 3 |
| USP 526 | Neighborhood Conservation and | 4 |
|  | Change |  |
| USP 527 | Commercial District | 3 |
|  | Revitalization |  |
| USP 534 | Green Buildings | 3 |
| USP 538/RE | Real Estate Law | 3 |
| 538S |  |  |
| USP 542 | Land Use Implementation | 3 |
| USP 551 | Community Economic | 3 |
|  | Development |  |
| USP 555 | Land Use:Legal Aspects | 3 |
| USP 563 | Real Estate Construction | 3 |
| USP 567 | Urban Housing Policies | 3 |
| USP 569 | Sustainable Cities and Regions | 3 |
| USP 570 | Trans portation and Land Use | 3 |
| USP 572 | RegionalEconomic | 3 |
|  | Development |  |
| USP 578 | Impact Assessment | 3 |
| USP 584 | Negotiation in the Public Sector | 4 |
| USP 588 | Sustainable Development | 3 |
|  | Practices |  |
| USP 590 | Green Economics and | 3 |
|  | Sustainable Development |  |
| USP 619 | DevelopmentPartnerships | 3 |
| USP 624 | Development Project Design | 3 |
| RE 510 | Property \& As set Management | 3 |
| RE 539/RE | Real Estate Valuation I | 4 |
| 539 S |  |  |
| RE 548 | Real Estate Market Analysis | 3 |
| RE 573/USP | Real Estate Economics | 4 |
| 573 |  |  |
| Fin 552 | Investments | 4 |
| Fin 554 | Alternative Investments | 2 |

Subtotal: 9
Total Credit Hours: 24
TRANSPORTATION GRADUATE CERTIFICATE

CORE

USP 544
Urban Trans portation Planning
3

| USP 556 | Urban Transportation: Problems <br> and Policies | 3 |
| :--- | :--- | :--- |
| USP 570 | Transportation andLand Use | 3 |

## ELECTIVES

| You must take | 12 credits fromthe following list: |  |
| :--- | :--- | :--- |
| CE 514/USP | Transportation Seminar | 1 |
| 514 |  |  |
| CE 558 | Public Transportation Systems | 4 |
| CE 559 | Transportation Operations | 4 |
| USP 537 | Economics of Urban <br>  <br> USP 543 | Transportation <br> Geographic Applications to |
|  | Planning | 4 |
| USP | Geographic Information Systems | 4 |
| 591/Geog | I: Introduction |  |
| 588 |  | 4 |
| USP 593 | Public Participation GIS |  |

Subtotal: 12
Total Credit Hours: 21
URBAN DESIGN

| Arch 521 | Urban Design Methods | 4 |
| :--- | :--- | :--- |
| Arch 532 | History and Theory of Urban <br> Design | 4 |
| Arch 531 | Studies in Contemporary Urban | 4 |
| USP 513 | Design |  |
| USP 575 | Urban Space | 4 |
|  | Urban Design Workshop | 4 |

## Total Credit Hours: 20

RESEARCH CENTERS AND INSTITUTES

## Center for Urban Studies

320 Urban Center
503-725-4045
www.pdx.edu/urban-studies-planning/
The Center for Urban Studies (CUS) at Portland State University facilitates, supports and promotes multidisciplinary research and community service by faculty and students at the Nohad A. Toulan School of Urban Studies and Planning on urban and regional systems, policies and is sues, such as planning and growth management, community development, sustainability, energy, transportation, economic development, housing, equity and justice. CUS provides the infras tructure for our
faculty and students to engage with communities, governments, organizations and institutions, and to highlight collaborative research and practice.

## Institute of Portland Metropolitan Studies

320 Urban Center
503-725-4045
www.pdx.edu/metropolitan-studies
Founded in 1991, the PSU Institute of Portland Metropolitan Studies (IMS) serves as a "front door" to the Portland community through:

- Engagement:IMS helps community and regional partners connect with PSU faculty and students around is sues related to urban and regional development in the Portland metropolitan region;
- Research:IMS supports engaged research that leverages PSU's faculty expertise and resources around important is sues facing the Portland metropolitan region; and
- Convening:IMS convenes partners and s takeholders to promote dialogue around important policy and planning is sues facing the Portland metropolitan region.

IMS receives funding support fromthe Oregon
Legis lature, and its purpose is established in ORS 352.703 to "build partnerships between Portland State University's urban studies programs and the surrounding communities of metropolitan Portland and to sponsor public service research."

## Political Science

650 Urban Center
503-725-3920
www.pdx.edu/political-science/

- B.A., B.S.
- Minor
- Minor in Law and Legal Studies
- Secondary Education Program-Social Science
- UndergraduateCertificate in Campaigning to W in a U.S. Political Campaign
- UndergraduateCertificate in Women's Leadership
- M.S.
- Ph.D.-Participating department in Public Affairs and Policy Doctoral Program


## Undergraduate programs

The programin political science leading to the B.A. or B.S. degree is designed to meet the needs of the liberal arts major who wishes to learn more about public and international affairs, government, and the demands of citizenship. It is appropriate for professionally motivated students who wish to pursue careers in political science, public adminis tration, international organizations, domestic government, communications, education, or law. It is also appropriate for inquiring students desiring to leam more about the way human beings live together and the structures and institutions they have developed (or might develop) to facilitate social cooperation and conflict management.
The most current information about undergraduate degree programs, internships, and other opportunities is available on the programwebsite.

## DEGREE MAPS AND LEARNING OUTCOMES

To view the degree maps and expected learning outcomes for Political Science's undergraduate degrees, go to www.pdx.edu/academic-programs/a-z.

## ADMISSION REQUIREMENTS

Admission to the department is based on general admission to the University. See Admis sions Requirements (p. 8) for more information.

## DEGREE REQUIREMENTS

Once a student has been admitted to Portland State University, upper-division courses used to meet political science major requirements must be taken at the University. Courses taken at another college or university must have received prior approval from the Department of Political Science. All courses used to satisfy political science major requirements, whether taken at PSU or elsewhere, must be graded Cor above. Students must complete a minimum of 20 credits of political science cours ework at PSU.
There are four different options for students completing a degree in political science: the standard major, the public service option, the international development option, and the honors program.

## POLITICAL SCIENCE B.A./B.S.

The standard major offers a traditional course of study in political science that involves some expos ure to three basic areas of the discipline. In addition to meeting the University's general education requirements, a student wishing to pursue a basic major in political science must
take a minimum of 48 credits in political science distributed as follows.

A minimum of 20 credits must be taken in residence at PSU.

## REQUIREMENTS

Lower Division Requirements
Three courses from the following four options (12 credits)

| PS 101 | United States Government <br> or |
| :--- | :--- |
| PS 102 | United States Politics |
| PS 204 | Comparative Politics |
| PS 205 | International Politics |
| PS 208 | Introductionto PoliticalTheory |

Upper Division Requirements (36 credits)
Five 400-level PS courses
Additional PS electives 16 (minimum 12 upper division)

Subtotal: 48

## PUBLIC SERVICE OPTION

The Public Service option in Political Science is designed for students who want a more hands-on experience in the major or are interested in practical politics. The curriculum provides students with a strong foundation in American government, while instilling in theman understanding of public service. Students in this track are required to serve an internship in a governmental or political office.

## Lower Division Requirements

Three courses from the following four options (12 credits)

| PS 101 | United States Government <br> or <br> United States Politics |
| :--- | :--- |
| PS 102 | Un |
| PS 204 | Comparative Politics |
| PS 205 | International Politics |
| PS 208 | Introduction to PoliticalTheory |

## Upper Division Core Requirements

Take two from the following four options (8 credits):

| PS 331 | Oregon Politics | 4 |
| :--- | :--- | :--- |
| PS 335U | Race and Politics in the United | 4 |
|  | States |  |
| PS 419 | Political Reform | 4 |

Additional electives ( 20 credits, minimumof 12 in Political Science)

Political Science options:

| PS 310 | How to Win a U.S. Political <br> Campaign | 4 |
| :--- | :--- | ---: |
| PS 312 | Legis lative Process |  |
| PS 313U | The Power Game: A Simulation | 4 |
| of Washington Politics | 4 |  |
| PS 316U | Politics and the Arts | 4 |
| PS 318U | Media, Opinion, and Voting | 4 |
| PS 319U | Politics of the Environment | 4 |
| PS 331 | Oregon Politics | 4 |
| PS 335U | Race and Politics in the United | 4 |
|  | States |  |
| PS 380U | Women and Politics | 4 |
| PS 381U | Women's Leadership | 4 |
| PS 412 | The Presidency | 4 |
| PS 413 | Congres s | 4 |
| PS 414 | Is sues in Public Policy | 4 |
| PS 416 | Political Parties and Elections | 4 |
| PS 417 | Interest Groups | 4 |
| PS 418 | Contemporary Political Protest in | 4 |
| PS 419 | America |  |
| PS 421 | Political Reform | 4 |
| The Supreme Court and | 4 |  |
| PS 424 | American Politics | Law, Politics, and Society |
| PS 427 | The Politics of Public Opinion | 4 |
| PS 429 | American Immigration Politics | 4 |
| PS 431 | \& Policy | 4 |
| PS 435 | State and LocalPolitics | 4 |
| PS 471 | Disasters andPublic Policy | 4 |
|  | Gender \& Politics: A | 4 |
| Comparative Perspective |  |  |

Courses used to meet the core requirements cannot be used at the s ame time to fulfill the elective requirements.
Public Administration options:

| PA 311U | Introduction to Civic |
| :--- | :--- | :--- |
|  | Engagement |

PA 312U Foundations of Community 4
Leadership
PA 313U Fundamentals of Public Service
PA 320U Introduction to Nonprofit 4
Management
PA $412 \quad$ Civic Engagement: The Role of 4
Civic Engagement: The Role of 4
Individuals
PA 414 Civic Engagement: The Role of 4
Social Institutions
PA $417 \quad$ Ethical Leadership
PA $425 \quad$ Grantwriting for Nonprofit 4

| Field Experience (8 credits) |  |  |
| :---: | :---: | :---: |
| PS 404 | Cooperative Education/Internship | 8 |
| Subtotal: 48 |  |  |
| Courses not required for the Public Service Option, but recommended for those interestedin public service careers: |  |  |
| Comm | Media Literacy | 4 |
| 312 U |  |  |
| Comm | Communication in Groups | 4 |
| 313 U |  |  |
| Ec 201 | Principles of Microeconomics | 4 |
| Ec 202 | Principles of Macroeconomics | 4 |
| Ec 311 | Microeconomic Theory | 4 |
| Ec 312 | Macroeconomic Theory | 4 |
| USP 316 | Community Organizing and Social Change | 4 |
| USP 317U | Introductionto International | 4 |
|  | Community Development |  |
| USP 386U | Portland Pastand Present | 4 |
| USP | Population and Society | 4 |
| 419/Soc 441 |  |  |
| USP 428 | Concepts of Community Development | 4 |

## INTERNATIONAL DEVELOPMENT OPTION

International development involves questions of global governance, international and development economics, foreign aid and humanitarian assistance, poverty reduction and human development, sustainable development, and international and intergenerational justice.

## Lower Division Requirements

Three courses from the following four options (12 credits)

| PS 101 | United States Government <br> or |
| :--- | :--- |
| PS 102 | United States Politics |
| PS 204 | Comparative Politics |
| PS 205 | International Politics |
| PS 208 | Introductionto PoliticalTheory |

## Upper Division Requirements

Two courses from the following options ( 8 credits)

| PS 410 | Political Economy of <br> Development | 4 |
| :--- | :--- | :--- |
| PS 447 | International Organization | 4 |
| PS 448 | International Law | 4 |
| PS 449 | International Environmental | 4 |
|  | Politics and Law |  |
| PS 454 | International Political Economy | 4 |
| PS 477 | Global Food Politics and Policy | 4 |

## Political Science electives

| Four courses from the following options (16 credits) |  |  |
| :--- | :--- | :--- |
| PS 319U | Politics of the Environment | 4 |
| PS 352U | Introduction to European Politics | 4 |
| PS 353U | Introduction to Latin American <br> Politics | 4 |
| PS 354U | Introduction to AsianPolitics | 4 |
| PS 355U | Introduction to AfricanPolitics | 4 |
| PS 361U | Introductionto the Politics of the <br> Middle East | 4 |
| PS 362U | Arab-Israeli Conflict |  |
| PS 373 | Violence, Rebellion, and Civil <br> War | 4 |
| PS 460/Intl | Political Developmentin Modem | 4 |
| 460 | Turkey |  |
| PS 461/Intl | Politics of Economic Reform in <br> Modern Turkey | 4 |
| PS 466 | Politics of China <br> PS 471 | Gender \& Politics: A <br> Comparative Perspective |
| PS 472 | Democratization and <br> Authoritarianis min the Middle | 4 |
| PS 473 | East and North Africa <br> Government and Politics of Arab | 4 |
| PS 474 | North Africa |  |
| PS 479 | Democracy and Development in <br> PS 4atin America <br> Transitions to Democracy | 4 |
| Justice in the Modern World | 4 |  |

## Non-Political Science electives

Two cours es from the following options ( 8 credits)
Ec 340 International Economics 4

Ec 442 The Multinational Enterprise in 4
Ec 445 Comparative Economic Systems 4
Ec 447 Economics of Transition 4
Ec $450 \quad$ Economics of Development 4
Intl397 Theory and Policy in 4
International Development
Cities and Third World
$\begin{array}{lll}\text { Intl } & \text { Cities and Third World } & 3 \\ \text { 445/USP } & \text { Development } & \end{array}$
445
Intl490 Global Sustainable Development 4
USP 312U Urban Housing and 4
Development
USP 317U Introduction to International 4
Community Development
Population and Society
$\begin{array}{lll}\text { USP } & \text { Population and Society } & 4 \\ \text { 419/Soc } 441 & \end{array}$
USP 490 Green Economics and 3
Sustainable Development

## Research Project (4 credits)

Students participating in the PS International Development track option are required to execute a substantial research paper ( $20-25$ pages) on a development-related topic of their choosing. Students should identify a PoliticalScience faculty member from the list below who agrees to oversee the PS 405 project, offereducational guidance and support and enrollthe student using the "By Arrangement" form. The minimum credit requirement for the Final Project is 4 student credit hours (SCH), with a maximum of 6 SCH possible for larger projects. For students completing projects worth more than 4 SCH , the additional credits may not substitute for other requirements in the ID track option. In certain cases, students seeking Political Science Honors credit may use their PS Honors paper to fulfill the requirements for the ID track option with the approval of the faculty member(s) overseeing these projects.

As an alternative to the res earch project, students may participate in a professional internship that supports theID Track option's basic educational goals. Students must independently locate an internship opportunity, identify a faculty member from the list below who will oversee the internship, sign off on the PS 404 internship contract, and enroll in the internship using the "By Arrangement" form. A written report ( $6-8$ pgs.) specifying how the internship experience fits with the student's educational goals and how it relates to and advances the educational content of the degree track option is to be submitted to the student's faculty advisor by the end of finals week during the quarter in which the internship is completed. The number of SCH gained through an internship is proportional to the number of work hours the internship requires, with each SCH worth 30 hours of work during a quarter. Students must complete an internship worth 4 SCH to satisfy the track option requirements, with a maximum of 12 SCH possible. For students completing internships worth more than 4 SCH, the additional credits may not substitute for other requirements in the ID track option.

| PS 404 | Cooperative Education/Internship $1-12$ <br>  or |  |
| :--- | :--- | ---: |
| PS 405 | Reading and Conference | $1-6$ |

Subtotal: 48

## POLITICAL SCIENCE HONORS PROGRAM

The honors programis designed for our top students who seek out additional intellectual challenges, including research and writing an honors thesis during their senior year. It is distinct fromthe University Honors Program, but political science majors may be admitted to both programs.
Students apply for admis sion to the programduring the winter or spring quarter of their junior year. To be eligible
for the honors program, a student must be a political science major and have earned at least a 3.2 grade point average overall and a 3.5 GPA in their political science coursework. Applicants submit the following information to the Honors Programadvis or: PSU and other college transcripts, letters of recommendation fromtwo political science faculty, and a statement of purpose ( 500 words or less) indicating interest in the program, area of research for the honors thesis, and the faculty member willing to supervisethe research.

## REQUIREMENTS

Political science honors students complete all of the cours ework required for the standard major, but honors coursework must include the following:

## Required Courses

PS 411 Advanced Overview of Political 4
PS 491 Testing Theories in Political Science
PS 403 Honors Thesis
Thes is credits are awarded in conjunction with thesis research and writing during the senior year, and students submit and defend their honors theses at the end of their senior year. For political science students who are also enrolled in the University Honors Program, the process is designed to satisfy the thesis requirements of both programs, although these students have theoption of enrolling in up to 4 credits of HON 403 rather than PS 403.

## POLITICAL SCIENCE MINOR

The minor in political science requires fewer credits than the standard major and may be combined with other majors offered at PSU. Of the 28 required coursecredits, students must complete at least 16 at PSU.

## REQUIREMENTS

## Lower Division Requirements

Two courses from the following four options (8 credits)
PS 101 United States Government
4
or
PS 102 United States Politics
4

PS 204 Comparative Politics 4
PS 205 International Politics 4
PS 208 Introduction to Political Theory 4

## Upper Division Requirements

Five courses ( 20 credits, minimum 12 at 400-level)

All courses submitted to satisfy the requirement for a minor in political science mustbe passed with a grade of C or above. Students are encouraged to take political science courses that complement their academic interests and scholarly goals. The political science minor is designed to be as flexible as possible to facilitate this end. Students considering a minor in political science are strongly encouraged to consult with a political science adviser to work out an instructional programthat meets theirneeds.

## LAW AND LEGAL STUDIES MINOR

The minor in law and legal studies offers an interdis ciplinary, liberal arts approach to the study of law. This is an academic program, not a professional training program, emphasizing the political, social, cultural, and philosophical foundations and impacts of law and legal systems. It is designed forpre-law students and also for a broad array of students fromacross the PSU campus who are interested in the relationship of law to politics, society, and culture. While the core courses concentrate on American law and the American legal system, the electives allow students to focus on aspects of law related to areas such as international law, comparative law, and philosophy.

## REQUIREMENTS (12 CREDITS)

| Lower Division Requirements |  |  |
| :---: | :---: | :---: |
| PS 101 | United States Government | 4 |
| PS 221 | Introduction to Law and Legal Studies | 4 |
| Upper Division Requirements |  |  |
| PS 321 | Introduction to the Supreme | 4 |
|  | Court |  |
| ELECTIVES (16 CREDITS) |  |  |
| Political Science options (minimum 8 credits) |  |  |
| PS 320 | Explore the Law | 2 |
| PS 325U | Politics and the Legal | 4 |
|  | Enforcement of Morals |  |
| PS 421 | The Supreme Court and | 4 |
|  | American Politics |  |
| PS 422 | Constitutional Law | 4 |
| PS 423 | Civil Liberties | 4 |
| PS 424 | Law, Politics, and Society | 4 |
| PS 425/WS | Women and the Law | 4 |
| 424 |  |  |
| PS 448 | International Law | 4 |
| PS 449 | International Environmental | 4 |
|  | Politics and Law |  |
| PS 483 | Justice in the Modern World | 4 |
| Non-Political Science options (maximum 8 credits) |  |  |
| CCJ 310 | American Courts | 4 |
| CCJ 345 | Human Behavior and the Law | 4 |


| CCJ 420 | Criminal Law and Legal <br> Reasoning <br> Civil Rights and the Law: The | 4 |
| :--- | :--- | ---: |
| Hst 446 | History of Equal Protection <br> "You have the right to remain <br> silent.":Language and the Law | 4 |
| Ling 334U |  |  |

CAMPAIGNING TO WIN A U.S. POLITICAL CAMPAIGN UNDERGRADUATE CERTIFICATE


#### Abstract

About This Program Political campaigns are a fast-paced, high-stakes endeavor. Campaign workers operate in a highly competitive environment where both collaboration and individual skill and initiative are required for teamsuccess. Campaigns can be stres sful and chaotic, and campaign workers need to have a broad-based skill set in communication, organization, leadership, data analysis, and strategic thinking to thrive in the dy namic landscape of a modern campaign. While these skills can be, and often are, acquired on the go, campaigns benefit greatly from workers who enter with the necessary skills and experience.

Building on the foundation of academic training provided by a Political Science or related major, this certificate takes participants into the real world of political campaigns, showing them what it takes to win and giving theman opportunity to develop the skills needed to contribute to a winning effort. Students completing the certificate will acquire marketable skills at the same time that they are developing a well-grounded understanding of the mechanics and dy namics of the campaign process and its linkages with the party systemand the broader political system.

\section*{Who Should Attend}

This certificate programis intended for undergraduate students studying Political Science or a related field who


want to obtain high-level, meaningful work on a political campaign at the entry-point of their career in politics.

## What You'll Learn

Upon completion of this program, students will be able to:

- describe in detail how election campaigns are organized and run at the local, state, and nationallevel;
- explain how campaigns function within the political culture, party system, and electoral environment of the United States;
- demonstrate essential skills utilized by campaigns, such as fundraising, networking, field organizing, speechwriting, polling and poll;
- interpretation, candidate management, media relations, etc.;
- function as a productive teammember in the highintensity, high-stakes, and highly competitive environment of a present-day political campaign.

| 3 Required Classes |  |  |  |
| :--- | :--- | :---: | :---: |
| PS 310 | How to Win a U.S. Political <br> Campaign | 4 |  |
| PS 416 | Political Parties and Elections | 4 |  |
| PS 318U | Media, Opinion, and Voting <br> or | 4 |  |
| PS 427 | The Politics of Public Opinion | 4 |  |
| Subtotal: 12 |  |  |  |

PS 318U and PS 427: The course not taken as a requirement may be taken as an elective.

## 3 Electives

Choose fromthe following list:

| PS 318U | Media, Opinion, and Voting <br> or | 4 |
| :--- | :--- | ---: |
| PS 427 | The Politics of Public Opinion |  |$\quad 4$

Subtotal: 12
PS 318U and PS 427: The course not taken as a requirement may be taken as an elective.

## Internship

Students will be placed with a candidateorballot-measure campaign. Students who have previously worked on a campaign can apply for a waiver of this requirement by obtaining a letter of performance from the campaign manager and writing a report for the instructor of PS 399/PS 310 outlining duties and examining les sons learned and skills acquired. Internship will be supervised by the programdirector or as signed to another full-time PS faculty member.

Subtotal: 4-12
Total Credit Hours: 28

## WOMEN'S LEADERSHIP UNDERGRADUATE CERTIFICATE

The Undergraduate Certificate in Women's Leadership provides undergraduate students with a focu sed course of study on women leaders across disciplines, with an emphas is on the challenges that they face and techniques for overcoming those challenges. Certificate requirements include both political science and women's studies courses, in addition to electives drawn fromdepartments across campus. This certificateoffers an interdisciplinary understanding of the current is sues facing women leaders today, and als orequires participation in a skillbuilding seminar (PS 381) des igned to foster students' confidence and leadership ability. This certificate is open to any undergraduate with interest in women's leadership.

Students are required to complete degree requirements specified in their major in order to be awarded the Women's Leadership Certificate. In addition, students must complete all certificate requirements.

## REQUIRED COURSES

| PS 380U | Women and Politics | 4 |
| :--- | :--- | :---: |
| PS 381U | Women's Leadership | 4 |
| WS 101 | Introductionto Women's Studies | 4 |
| Subtotal: 12 |  |  |
| ELECTIVE COURSES |  |  |
| Choose 8 credits from approved electives below: |  |  |
| CCJ 350U | Ethical Leadership in Criminal | 4 |
| NAS 344 | Justice <br> PA 312U | Indigenous WomenLeadership <br> Leadership |
| PS 425/WS | Women and theLaw <br> 424 | 4 |
| PS 471 | Gender \& Politics: A <br> WS 30mparative Perspective | 4 |
| W | Resistance, Activism, and Social <br> Change | 4 |

WS 451 Interrupting Oppression 4

Subtotal: 8

## Total Credit Hours: 20

## Graduate Program

The Department of Political Science offers a programof study leading to a master of science (M.S.) degree. There are two alternative tracks. The Ph.D.-preparation track is designed for students who are seriously contemplating the pursuit of a doctoral degree in political science after finishing their master's degree at PSU. The professional track is designed for other students-e.g., those interested in careers in law, legis lative affairs, or the foreign service. The Department also participates in the Public Affairs and Policy Ph.D. Program.

## ADMISSION REQUIREMENTS

The master's programgenerally attracts students with undergraduate degrees in political science, but is open to students with a wide variety of disciplinary backgrounds. The programadmits graduate students during the fall term. Procedures and deadlines for applications are provided on the program website.
The following materials should be submitted through the application link found on the Graduate School's website.

- Non-refundable $\$ 65$ application fee (no cash)
- One transcript fromeach post-secondary institution attended (both sides need to be uploaded)
- A 500 word statement of intent. The statement should address the following: 1) Professional goals; 2) Planned area of study;3) Des ired employment sector; 4) How the degree furthers achievement of your professional goals
- Two recommendation letters fromindividuals familiar with the applicant's academic and/or professional capabilities. Preferably, the letters should be from former instructors or fromindividuals with knowledge of your professional performance and potential.
- The scores of the Graduate Record Examination (GRE). Please note that you should make arrangements to take the GRE well in advance of the application deadline.
- Measles Vaccine Form
- Official TOEFL scores if the applicant does not speak English as a native language and has notreceived a graduate or undergraduate degree in an Englishspeaking territory.
- Required financial documentation (if International)
- International Applicants who currently reside in the United States with an F-1 or J-1 vis a must fill out the SEVIS form


## POLITICAL SCIENCE M.S.

The M.S. in Political Science is a two-year programthat provides students with the theories, research skills, and practical understanding of government and politics neces sary to pursue both professional and academic careers. It is unique among masters programs in political science in offering a course of study especially designed to prepare students to succeed as doctoral students in the discipline's most competitive Ph.D. programs. For students less interested in academic careers, the programoffers a course of study well suited to professions in such fields as law, public policy, legislative affairs, and the foreign service. Learning outcomes include:

- Knowledge of the main theories and methodological approaches defining two of the subfields of political science, with a more advanced mastery of one of them.
- Ability to independently evaluate conflicting arguments, interpret evidence fromalternative analyses, and make reas oned conclusions from the evidence available.
- Analytic skills to formulate an originalresearchquestion, design and carry out an appropriate study for answering the question, and communicate the findings to a scholarly community.


## REQUIREMENTS

Master's degree students in both the Ph.D.-preparation and the professional tracks follow a similar course of study during the first year in the program, which includes three required courses on theory and research in political science, a choice of two seminars on the primary subfields in political science, and two additional political science electives. During the second year, professional track students may substitute up to 8 credits of Internship for elective courses taken by students in the Ph.D.-preparation track. Coursework, including credit for work on the master's thesis (seebelow), is distributed as follows:
First Year Coursework
Fall
PS 511

PS 590

PS 5XX
PS 5XX

Advanced Overview of Political
Science
Introduction to Graduate School: Skills forScholarly Success

Field Seminar
or
Political Science Elective

4

1

4

4

| Winter |  |  |
| :---: | :---: | :---: |
| PS 594/PAP | Research Design forPolitics and | 4 |
| 690 | Policy |  |
| PS 5XX | Political Science Elective | 4 |
| PS 5XX | Field Seminar | 4 |
| PS 5XX | or Political Science Elective | 4 |
| Spring |  |  |
| PS 591 | Testing Theories in Political Science | 4 |
| PS 503 | Thes is | 1 |
| PS 5XX | Field Seminar | 4 |
|  | or |  |
| PS 5XX | Political Science Elective | 4 |
| Second Year Coursework |  |  |
| Fall |  |  |
| PS 503 | Thes is | 3 |
| PS 589 | How to Teach and Present Social Science Research | 2 |
| PS 5XX | Political Science Elective or | 4 |
| PS 504 | Internship | 4 |
| Winter |  |  |
| PS 503 | Thes is | 3 |
| PS 5XX | Political Science Elective | 4 |
|  | or |  |
| PS 504 | Internship | 4 |
| Spring |  |  |
| PS 5XX | Political Science Elective | 4 |
| PS 503 | Thes is | 2 |
| The following courses qualify as Field Seminars: |  |  |
| PS 520 | Seminar on American Political Institutions | 4 |
| PS 530 | Proseminar in International | 4 |
|  | Relations |  |
| PS 569 | Comparative Political | 4 |
|  | Institutions |  |
| PS 585 | Political Theory and Governance | 4 |
| Thesis |  |  |
| The final requirement for the degree is themaster's thesis-an original investigation that demonstrates mastery of a topic in political science and the ability to communicate this understanding to an audience of one's peers. The thesis topic is chosen during Spring term of the first year in consultation with the student's thesis advisor, who supervises the drafting of a thesis prospectus. The thesis prospectus is defended by the end of the term, at which time the student either receives approval to move forward with thes is research or is directed to revise the |  |  |

prospectus for a second defense in Fall term of the second year.

The completed thesis is defended during Spring termof the second year in an oral presentation laying out the purpose, implementation, and findings of the project, and making a case for its contribution to political science scholarship. In order to count toward fulfillment of master's degree requirements, courses must be passed with a grade of B - or above. No more than two online classes can becounted toward the fulfillment of degree requirements. Students are required to meet with oremail their advis ors to approve their classes before each term.
Total Credit Hours: 52

## Public Administration

650 Urban Center
503-725-3921
www.pdx.edu/public-administration/

- Minor in Civic Leadership (p. 434)
- M.P.A.(p.435)
- M.P.A.:Health Administration(p.436)
- M.N.L. (p. 439)
- E.M.P.A. (p. 439) (p. 440)
- Graduate Certificates:
(p. 440) (p. 440)
- Nonprofit \& Public Management (p. 440)
- Sustainable Food Systems (p. 148) (Participating Department with Urban Studiesand Planning)
- Collaborative Governance (p. 437)
- Emergency Management and Community Resilience (p.387) (Participating Department with Anthropology, Communication, Geography, and Urban Studies and Planning)
- Energy Policy \& Management (p. 423)( Participating Department with Urban Studies and Planning, Economics, Engineering and TechnologyManagement, and System Science)
- Futures Thinking and ForesightPractice (p. 202) (GraduateSchool Program. Participating Department) (p.440)
- M.P.P.: (p. 409) (Participating Department with Hatfield SchoolofGovernment)
- M.S. in Emergency Management Community Resilience (p.386) (Participating Department with Anthropology, Communication, Geography, and Urban Studies and Planning)
- P.A.P.Ph.D. (p. 406) (Participating Department with Hatfield School ofGovernment) (p. 357)

The Department of Public Administration offers a variety of programs to meet the educational needs of public service professionals. Mid-career managers and those intending such careers in federal, state, and local government; nonprofit agencies; and hospitals and other health care organizations are attracted to the programs offered by the department because of the quality of the faculty, the reputation of the programs, and the convenience of course scheduling. In addition to its own faculty and course offerings, the Department of Public Administration draws upon faculty and courses fromother departments and schools, such as political science, economics, criminology and criminal justice, urb an studies and planning, gerontology, public health, anthropology, geography, communication, and environmental science. Adjunctfaculty with appropriate academic credentials and significant professional experience in government, nonprofit, and health organizations als o contribute to the department.
The graduate programs offered under the Departmentof Public Adminis tration admit students with undergraduate degrees in a variety of social sciences, as well as in business, the humanities, and sciences. It accepts both fulland part-time students, who have had substantial governmental and nonprofit experience, and who have little or no professionalexperience. To accommodate graduate students who are currently working, the department offers sections of all required courses in the evenings or late afternoons or in intensive weekend formats.

## Accreditation

The Mas ter of Public Adminis tration, the Master of Public Adminis tration: Health Adminis tration and the Executive Master of Public Adminis tration degrees are accredited by NASPAA (the Network of Schools of Public Policy, Affairs and Adminis tration).

## Doctoral students

See the graduate program within the Hatfield School of Government for details under the Doctor of Philosophy in Public Affairs and Policy (p.406).

## Undergraduate Programs

## DEGREE MAPS AND LEARNING OUTCOMES

To view the degree map and expected learning outcomes for Public Administration's undergraduate minor, go to https://www.pdx.edu/academics/programs/undergraduate/c ivic-leadership

## CIVIC LEADERSHIP MINOR

The interdisciplinary Civic Leadership minor provides students with theoretical and practical understanding about civic leadership, and prepares students to be responsibly engaged citizens and community leaders. Students who minor in civic leadership mustcomplete core and elective courses for a total of 34 credits (at least 20 of which must be taken in residence at PSU). Some of these courses have prerequisites, and students should read course descriptions in the current PSU Bulletin before registration. A preapproved 6-credit community-based civic leadership practicumis required as part of the minor. The practicum requirement may be fulfilled by any UNST Senior Caps tone courseorby an independently developed and approved community-based learning experience.

## REQUIREMENTS

| Required (12 credits total): |  |  |
| :---: | :---: | :---: |
| PA 311U | Introduction to Civic | 4 |
|  | Engagement |  |
| PA 312U | Foundations of Community | 4 |
|  | Leadership |  |
| PA 415 | Civic Leadership Integrative | 4 |
|  | Seminar |  |
| Civic Leadershipelectives ( 8 credits needed, choose two |  |  |
| from below): |  |  |
| PA 313U | Fundamentals of Public Service | 4 |
| PA 412 | Civic Engagement: The Role of | 4 |
|  | Governing Institutions |  |
| PA 413 | Civic Engagement: The Role of | 4 |
|  | Individuals |  |
| PA 414 | Civic Engagement: The Role of | 4 |
|  | Social Institutions |  |
| PA 417 | Ethical Leadership | 4 |
| Other electives ( 8 credits needed, choose two from below): |  |  |
| CCJ 350U | Ethical Leadership in Criminal | 4 |
|  | Justice |  |
| Comm | Communication in Groups | 4 |
| 313U |  |  |
| ELP 318U | Introduction to Educational | 4 |
|  | Leadership in Public Schools |  |
| ELP 350U | Introduction to Leadership for | 4 |
|  | Sustainability |  |
| PA 314U | Students as Leaders | 4 |
| PA 315U | Managing People for Change | 4 |
| PA 316 | Leadership in New Student | 3 |
|  | Programs |  |
| PA 320U | Introduction to Nonprofit | 4 |
|  | Management |  |
| PA 425 | Grantwriting forNonprofit | 4 |
|  | Organizations |  |
| PS 312 | Legis lative Process | 4 |
| PS 318U | Media, Opinion, and Voting | 4 |


| PS 325U | Politics and the Legal <br> Enforcement of Morals | 4 |
| :--- | :--- | :--- |
| PS 417 | Interest Groups | 4 |
| PS 431 | State and Local Politics | 4 |
| USP 350U | Inclusive Engagement | 4 |

Community-based practicum ( 6 credits total)

## Graduate Programs

## ADMISSION REQUIREMENTS

In determining admis sion to the Department of Public Administration, the faculty assesses the applicant's preparation for and commitment to the unique demands of a public service career. It considers the following combination of evidence, all of which must be submitted to PSU's on-line application system:

1. The appropriateness and quality of academic preparation demonstrated by the breadth and content of prior academic coursework. A minimum GPA of 3.00 in undergraduate coursework is generally expected of students seeking regular admission status. Exceptions are occas ionally made to this requirement when supported by other compelling evidence.
2. Three independent assessments of the applicant's ability to performadequately in graduatestudies and potential for high-levelperformance in public service. The three letters of as sessment, on forms provided by the Department of Public Administration, and supplemented by personal letters, should be provided by faculty members from colleges or universities previously attended or by other persons in a position to comment on the applicant's academic background and professional experience. One letter should be fromthe applicant's current employer, if any.
3. A résumé.
4. A TOEFL score of 550 on paper, 213 on computer or 80 on internet is required of every applicant whose first language is not English. This is a requirementeven if the applicant has earned an undergraduate degree in the United States.
5. All degrees offered by the Department of Public Administration require the submis sion of a Statement of Purposefrom the applicant. Specific format and content for the Statement of Purpose differ from degree to degree.
a. The MPA, MPA:HA, and MNL requirements may be found at www.pdx.edu/public-adminis tration/public-administration-graduate-programs-and-admissions-criteria.
b. The EMPA admis sion requirements may be found at www.pdx.edu/public-administration/executive-master-public-administration.
c. The admis sion requirements for Certificates in Nonprofit and Public Management, Collaborative Governance, Food Systems and Energy Policy \& Management may be found at www.pdx.edu/publicadminis tration/graduate-certificates.

Students may apply for admission any time throughout the calendar year. The Department of Public Adminis tration maintains the same application deadlines published for the University for official admission in fall, winter, and spring terms.

## Limitation on by-arrangement courses

Admitted master's students may utilize up to 12 credits of by-arrangementclasses (501 and 505). In cases where more than 12 credits are needed because of the lack of regularly scheduled clas ses, a waiver must be submitted for approval to the department curriculumcommittee and the departmentchair.

## Limitation on acceptance of C grades

No student may use more than two Cgrades toward graduation for a graduate degree fromthe Department of Public Administration.

## DEGREE REQUIREMENTS

The Department of Public Administration offers four Masters Degrees: Master of Public Adminis tration (MPA), Master of Public Adminis tration in Health Administration (MPA-HA), Master of Nonprofit Leadership (MNL), and an Executive Master of Public Adminis tration (EMPA) degree. Please see below for the Requirements of each degree.

For the interdisciplinary programs please refer to the Master of Public Policy (p. 409) and M.S. in Emergency Management and Community Resilience (p. 386) sections of the catalog.

## MASTER OF PUBLIC ADMINISTRATION M.P.A.

## REQUIREMENTS

Substantive Core (30)
PA 511 Public Administration 3
PA 513 Administrative Ethics and Values 3
PA 533 Public Policy: Origins and 3
Process
PA 534 Administrative Law

| PA 540 | Administrative Theory and <br> Behavior |
| :--- | :--- |
| PA 551 | Analytic Methods in Public <br> Administration I <br> Analytic Methods in Public |
| PA 552 | Administration II |
| PA 582 | Public Budgeting <br> PA 585 |
| Financial Management in the |  |
| PA 590 | Public Sector |
|  | Human Resource Management in <br> the Public Sector |

PA 585 may be substituted with an economics course approved by adviser

## Skill Development (9)

Three of the following:

| PA 525 | Grantwriting forNonprofit | 3 |
| :--- | :--- | :--- |
|  | Organizations |  |
| PA 536 | Strategic Planning | 3 |
| PA 545 | Organizational Development | 3 |
| PA 546 | Supervision in the Public Sector | 3 |
| PA 549 | Cross-cultural Communication in <br> the Public Sector | 3 |
| PA 554 | Policy Analysis Res earch | 3 |
| PA 555 | ProgramEvaluation and <br> Management | 3 |
| PA 556 | Public Contract Management | 3 |
| PA 558 | Managing Public Projects and <br> Programs: FromLocal to Global | 3 |
| PA 562 | Managing Employee |  |
| PA 594 | Performance in the Public Sector <br> Enhancing Diversity in the | 3 |
|  | Workplace | 3 |

Other courses not listed here but appropriate to the educational goals of the student may be selected to fulfill the skill development requirements with consent of the student's adviser.

## Integrative Experience (6)

The integrative experiencePA 509 is available to students only after they have completed at least 42 credits in their master's program.
$\begin{array}{lll}\text { PA 509 } & \text { Organizational Experience } & \text { 1-6 }\end{array}$
Subtotal: 6
Field of Specialization (15)
The MPA programoffers the following formal fields of specialization: nonprofit management, natural res ources policy and administration, local government, and global leadership and management. Students may also work with their advisor to design their own specially designed field of specialization. Students declare an intended field of specialization by the time they complete 30 credits of the MPA programby filing a "field ofspecialization" form with a proposed programof study. The specialization and
programof study may be changed based upon consultation with the faculty advisor.

Requirements for the formal fields of specialization are:

Nonprofit Management: Four required courses and one elective course. One of the four required courses in this specialization substitutes for the required budgeting course in the core of the program, allowing students to take an additional elective course.
Natural Res ources Policy and Administration: Two required and three elective courses.
Local Government: Two required and three elective courses.
Global Leadership and Management: Two required and three elective courses.

Students are encouraged to work with their advis ors to take advantage of course offerings in other academic units, as well as other professional experiences that may be recommended by faculty advis ors. Detailed information on specializations can be found at www.pdx.edu/public-administration/mpa-specializations.

## Diversity

At some point within their programof study students must satisfactorily complete one course the primary focus of which is diversity. This does not require additional credit hours or coursework beyond the 60 credit requirement and can include courses taken as skill development or specialization classes. Course options include, but are not limited to the following.

| PA 514 | Global Leadership and <br> Management | 3 |
| :--- | :--- | ---: |
| PA 523 | NongovernmentalOrganizations: <br> Nonprofits on the World Stage | 3 |
| PA 529 | Nonprofit Field Study in Oaxaca, <br> Mexico | $3-6$ |
| PA 544 | International Field Experience | 3 |
| PA 547 | Culture, Values and Leadership | 3 |
| PA 549 | Cross-cultural Communication in | 3 |
| PA 593 | the Public Sector |  |
| PA 59il Rights forPublic Managers | 3 |  |
|  | Enhancing Diversity in the | 3 |
|  | Workplace |  |

Other courses can be approved by the adviser.
HEALTH ADMINISTRATION M.P.A.
The Department of Public Administration offers a Master of Public Adminis tration: Health Administration degree. Students admitted to this degree are required to complete 60 credits of coursework. For students interested in geriatrics, gerontology, and the adminis tration of aging programs, the Institute of Aging offers a Graduate

Certificate in Gerontology, which may be earned in conjunction with the MPA:HA degree.

## REQUIREMENTS

| Required Courses (39) |  |  |
| :---: | :---: | :---: |
| PA 511 | Public Adminis tration | 3 |
| PA 513 | Adminis trative Ethics and Values or | 3 |
| HSMP 573 | Values and Ethics in Health | 3 |
| PA 533 | Public Policy: Origins and Process | 3 |
| PA 534 | Administrative Law or | 3 |
| HSMP 577 | Health Care Law and Regulation | 3 |
| PA 540 | Administrative Theory and Behavior or | 3 |
| HSMP 541 | Organizational Behavior in Health Service Organizations | 3 |
| PA 551 | Analytic Methods in Public Administration I | 3 |
| PA 552 | Analytic Methods in Public Adminis tration II | 3 |
| PA 582 | Public Budgeting | 3 |
| PA 590 | Human Resource Management in the Public Sector or | 3 |
| HSMP 580 | Health Services Human Resources Management | 3 |
| $\begin{aligned} & \text { PAH } \\ & 570 / \mathrm{HSMP} \\ & 570 \end{aligned}$ | Health Administration | 3 |
| HSMP 571 | Health Policy | 3 |
| HSMP 574 | Health Systems Organization | 3 |
| HSMP 586 | Introduction to Health Economics | 3 |

## Elective Courses (15)

Elective courses must be approved by your faculty advis or.
For each elective course you are considering, write a paragraph on how that course will help you with your career/professional development. For students with little or no experience in the health care sector, it is advised that you take PA 504 Cooperative Education within your first twelve months of the program.

## Field of specialization

MPA:HA students mustcomplete at least 30 credits that are health care specific by graduation. Consult with your advisor to verify acceptability of any cours es counted towards the specialization that do not have a PAH prefix.

## Integrative Experience (6)

The integrative experiencePAH509 is available to students only after they have completed at least 42 credits in their master's program.
PAH 509 Practicum 1-6

## Diversity

At some point within their programof study students must satisfactorily complete one course the primary focus of which is diversity. This does not require additional credit hours or coursework beyond the 60 credit requirement and can include courses taken as skill development or specialization classes. Courses options include, butare not limited to the following.

| PA 514 | Global Leaders hip and <br> Management | 3 |
| :--- | :--- | ---: |
| PA 523 | Nongovernmental Organizations: <br> Nonprofits on the World Stage | 3 |
| PA 529 | Nonprofit Field Study in Oaxaca, <br> Mexico | $3-6$ |
| PA 544 | International Field Experience | 3 |
| PA 547 | Culture, Values and Leadership | 3 |
| PA 549 | Cross-cultural Communication in | 3 |
| PA 593 | the Public Sector |  |
| PA 594 | Civil Rights for Public Managers | 3 |
|  | Enhancing Diversity in the | 3 |
|  | Workplace |  |

Other courses can be approved by the adviser.
Subtotal: 60

## COLLABORATIVE GOVERNANCE GRADUATE CERTIFICATE

The courses in this graduatecertificate programprovide current and future public service leaders with the advanced collaborative skills necessary for success in today's interconnected world.

To receive the Graduate Certificate in Collaborative Governance students must complete a minimum of 15 credit hours.

## REQUIREMENTS

## Core Courses

| PA 575 | Foundations of Collaborative <br> Governance | 3 |
| :--- | :--- | :--- |
| PA 576 | Collaborative Governance | 3 |
| USP 584 | Process and Systems <br> Negotiation in the Public Sector | 4 |

## Eective Courses

Choose two: Other courses may be counted for credit by approval of the faculty adviser.

| CR 512 | Foundations of Conflict Resolution | 4 |
| :---: | :---: | :---: |
| CR 515 | Negotiation | 4 |
| CR 518 | Psychology of Peace and | 4 |
|  | Conflict |  |
| CR 523 | Dialogue Across Differences | 4 |
| CR 524 | Advanced Mediation | 4 |
| CR 526 | Advanced Intercultural Conflict | 4 |
|  | Resolution |  |
| PA 519 | Civic Capacity | 3 |
| PA 543 | Creating Collaborative | 3 |
|  | Communities |  |
| PA 547 | Culture, Values and Leadership | 3 |
| PA 549 | Cross-cultural Communication in the Public Sector | 3 |
| PA 553 | Sustainable DevelopmentPolicy and Governance | 3 |
| PA 558 | Managing Public Projects and | 3 |
|  | Programs:FromLocal to Global |  |
| PA 563 | Citizens and Administration | 3 |
| PA 570 | Environmental and Natural | 3 |
|  | Resource Leadership |  |
| PAP 512 | Introduction to Policy Advocacy | 3 |
| PAP514 | Institutional Dynamics of Public | 3 |
|  | Policy |  |
| SW 541 | Societal, Community and | 3 |
|  | Organizational Structures and |  |
|  | Processes |  |
| SW 593 | Advanced Macro Practice I | 3 |
| USP 550 | Participatory Planning | 3 |
| ENERGY | LICY AND MANAGEMENT |  |
| GRADU | CERTIFICATE |  |

A total of five courses are required for the Graduate Certificate in Energy Policy and Management, with a minimum of 15 totalcredits.

The courses are listed below and offered across the programs collaborating on this interdisciplinary certificate. They are Public Adminis tration (PA); Urban Studies and Planning (USP); Economics (EC); Engineering Technology and Management (ETM); and Systems Science (SYSC).

Students will select one of the core courses, two of the focal area courses, and two of the professional skills courses, depending on interest and course availability. Courses need not be taken in any particular order, but the core course is recommended early in the program. The second core course (if taken) can be applied towards the focal area requirement.

## CORE COURSE

One of the following:

| PA 567 | Energy Resources Policy and <br> Administration <br> or <br> Green Buildings | 3 |
| :--- | :--- | ---: |
| USP 534 |  | Subtotal: 3 |
| Subtotal: 3 |  |  |
| FOCAL AREA COURSES |  |  |

Two courses required

| Ec 537 | Public Utility Economics | 4 |
| :--- | :--- | :--- |
| Ec 538 | Energy Economics | 4 |
| ETM 568 | Energy Technology Innovations | 4 |
| PA 572 | Columbia River Basin | 3 |
|  | Governance |  |
| PA 573 | Smart Grid and Sustainable | 3 |
|  | Communities: Making the Smart <br> Grid Work |  |
| USP 518 | Energy and Society | 3 |
| USP 582 | Sustainable Transportation | 3 |

Subtotal: 6-8 PROFESSIONAL SKILLS COURSES

Two courses required

Ec 527
Ec 528
Ec 530
Ec 569
Ec 570
Ec 571
Ec 572

ETM 525
ETM 530
ETM 531

PA 536 Strategic Planning

PA 555 ProgramEvaluation and 3
Management

Ec $526 \quad$ Economics of Regulation 4

ETM 534 Technology Roadmapping
ETM 540 Operations Research
ETM 545 Project Management
PA 551 Analytic Methods in Public
Administration I
PA 552 Analytic Methods in Public 3
PA $554 \quad$ Policy Analysis Research 3
Advanced Econometrics 4
Time Series Analysis and 4
Forecasts
Strategic Planning 4
Decision Making 4
Technology Assessment \& 4
Acquisition

| PA 556 | Public Contract Management | 3 |
| :--- | :--- | :--- |
| PA 558 | Managing Public Projects and | 3 |
|  | Programs:From Local to Global |  |
| SySc 514 | SystemDynamics | 4 |
| SySc 525 | Agent Based Simulation | 4 |
| USP 532 | Data Collection | 4 |
| USP 536 | Policy Evaluation Methods | 3 |
| USP 578 | Impact Assessment | 3 |
| USP 588 | Sustainable Development | 3 |
|  | Practices |  |
| USP 615 | Economic Analy sis of Public | 4 |
|  | Policy |  |
| USP 634 | Data Analysis I | 4 |

Subtotal: 6-8
Total Credit Hours: 15-19
EXECUTIVE M.P.A.
The Executive MPA offers a curriculumdesigned to prepare working professionals for advanced leadership in public organizations. Students are required to have 10 years of significant work experience. The programuses a cohort model to facilitate course sequencing and maximize learning across courses. Students are required to complete the following 45 credits of coursework.

## REQUIREMENTS

| Core courses |  |  |
| :---: | :---: | :---: |
| PA 513 | Adminis trative Ethics and Values | 3 |
| PA 517 | Leadership Development for | 3 |
|  | Public Organizations |  |
| PA 518 | Leading Public Organizations | 3 |
| PA 533 | Public Policy: Origins and | 3 |
|  | Process |  |
| PA 534 | Administrative Law | 3 |
| PA 539 | National Policy Process | 3 |
| PA 540 | Administrative Theory and | 3 |
|  | Behavior |  |
| PA 544 | International Field Experience | 3 |
| PA 545 | Organizational Development | 3 |
| PA 547 | Culture, Values and Leadership | 3 |
| PA 559 | Research Design and Analytic | 3 |
|  | Methods for Adminis trative |  |
|  | Leaders |  |
| PA 583 | Advanced Budgeting Concepts and Techniques | 3 |
| PA 590 | Human Resource Management in the Public Sector | 3 |

## Capstone Requirement

Students will register for the following two courses to complete their capstone, a culminating project intended to demons trate mastery of the core skills taught in the
programas applied to a real-life problemof public management:

| PA 508 | Reflective Practice | 3 |
| :--- | :--- | ---: |
| PA 512 | Case Analysis | $3-6$ |

Subtotal: 6
Subtotal: 45
Total Credit Hours: 45

## MASTER OF NONPROFIT LEADERSHIP

The Master of Nonprofit Leadership is designed to meet the needs of working professionals in the nonprofit sector and is thus offered in an accommodating format (mirroring the MPA program) -allowing students to apply and matriculate in fall, winter, and spring quarters, and proceed through the programin either full-time or part-time status.
The programis comprised of 54 credits.
Coursework will include a core are of knowledge (33 credits) which includes the following: Foundational Knowledge ( 12 credits); Fundamentals of Nonprofit Management ( 12 credits); and, Analytic Skills ( 9 credits).

## CORE: FOUNDATIONAL KNOWLEDGE

| PA 528 | Leadership for the Nonprofit <br> Sector | 3 |
| :---: | :--- | :--- |
| PA 521 | History AndFoundations of the <br> Nonprofit Sector | 3 |
| PA 513 | Administrative Ethics and Values |  |
| Choose one: |  |  |
| PA 547 | Culture, Values and Leadership <br> PA 549 | Cross-cultural Communication in <br> the Public Sector |
| PA 594 | Enhancing Diversity in the |  |
| PA 593 | Workplace <br> Civil Rights for Public Managers | 3 |
| SW 539 | SocialJustice in SocialWork | 3 |
| CObtotal: 12 |  | 3 |
| CORE: FUNDAM ENTALS OF NONPROFIT |  |  |


| PA 522 | Governance of Nonprofit <br> Organizations | 3 |
| :---: | :--- | :---: |
| PA 540 | Administrative Theory and <br> Behavior | 3 |
| PA 526 | Fundamentals of Fundraising in | 3 |
| PA 524 | Nonprofit Organizations <br> Financial Management in <br> Nonprofit Organizations | 3 |

Subtotal: 12

## CORE: ANALYTIC SKILLS

|  | PA 551 | Analytic Methods in Public <br> Administration I |
| :--- | :--- | :--- |
| PA 552 | Analytic Methods in Public <br> Administration II <br> ProgramEvaluation and <br> Management | 3 |
| PA 555 | 3 |  |
| Subtotal:9 |  |  |
| ADVOCACY, POLICYM AKING, AND |  |  |
| COMMUNITY CHANGE |  |  |

Total credits, Advocacy, Policymaking, and Community Change requirement: 6-7

## ELECTIVE COURSES

(Students choose 3 courses fromPA or another academic unit as approved by their faculty advis or. Recommended concentrations will be provided.)

Electives
9
ORGANIZATIONAL EXPERIENCE
PA 509 Organizational Experience
6
Total Credit Hours: 54
NONPROFIT AND PUBLIC MANAGEMENT GRADUATE CERTIFICATE

The Graduate Certificate in Nonprofit and Public Managementconsists of 21 credit hours of graduate course work in Public Administration with an emphasis in either
public or nonprofit management. The certificate is intended to provide existing and aspiring middle managers in nonprofit and public org anizations with the knowledge and skills necessary to be successful in carrying out their administrative responsibilities.

## REQUIREMENTS

| Required courses (6) |  |  |
| :--- | :--- | :--- |
| PA 511 | Public Administration | 3 |
| PA 540 | Administrative Theory and | 3 |
|  | Behavior |  |

## Elective courses (15)

Students must take five courses, and should meet with an advisorto plan a suitable complement of courses to meet their individual interests and professional development needs. Substitutions may be made with the permission of the academic advisor. Courses may be drawn fromany of six content/skill areas below, as well as fromacross the PA department course offerings in consultation with Graduate Certificate advisor.

| General Management |  |  |
| :---: | :---: | :---: |
| PA 513 | Administrative Ethics and Values | 3 |
| PA 520 | Introduction to Nonprofit | 3 |
|  | Management |  |
| PA 522 | Governance of Nonprofit | 3 |
|  | Organizations |  |
| PA 536 | Strategic Planning | 3 |
| Finance and Budgeting |  |  |
| PA 524 | Financial Management in | 3 |
|  | Nonprofit Organizations |  |
| PA 525 | Grantwriting forNonprofit | 3 |
|  | Organizations |  |
| PA 526 | Fundamentals of Fundraising in Nonprofit Organizations | 3 |
| PA 582 | Public Budgeting | 3 |
| PA 583 | Advanced Budgeting Concepts and Techniques | 3 |
| PA 585 | Financial Management in the Public Sector | 3 |
| Leadership and Human Res ource Management |  |  |
| PA 570 | Environmental and Natural | 3 |
|  | Resource Leadership |  |
| PA 517 | Leadership Development for | 3 |
|  | Public Organizations |  |
| PA 528 | Leadership for the Nonprofit | 3 |
|  | Sector |  |
| PA 590 | Human Resource Management in the Public Sector | 3 |
| PA 592 | Volunteeris mand Volunteer | 3 |
|  | Management |  |


| PA 594 | Enhancing Diversity in the Workplace | 3 |
| :---: | :---: | :---: |
| PA 598 | Values-based Management I | 3 |
| Community Building and Communication |  |  |
| PA 541 | Social Entrepreneurship | 3 |
| PA 527 | New/Emerging Nonprofits: Development and Management | 3 |
| PA 543 | Creating Collaborative Communities | 3 |
| PA 545 | Organizational Development | 3 |
| PA 549 | Cross-cultural Communication in the Public Sector | 3 |
| Public and Nonprofit Sector |  |  |
| PA 520 | Introduction to Nonprofit Management | 3 |
| PA 521 | History AndFoundations of the Nonprofit Sector | 3 |
| PA 522 | Governance of Nonprofit Organizations | 3 |
| PA 524 | FinancialManagement in Nonprofit Org anizations | 3 |
| PA 533 | Public Policy: Origins and Process | 3 |
| PA 534 | Administrative Law | 3 |
| Specific Management Skills |  |  |
| PA 538 | Advocacy and Political Participation by Nonprofit Organizations | 3 |
| PA 550 | Managing Information Resources | 3 |
| PA 555 | ProgramEvaluation and Management | 3 |
| PA 558 | Managing Public Projects and Programs: FromLocal to Global | 3 |

## DOCTORAL DEGREES

The Department of Public Administration cooperates with other units within the Hatfield School of Government to offer a doctoral degree in public affairs and policy. For details, see the programdescriptions.

## Doctoral Degrees

The Department of Public Administration cooperates with other units within the Hatfield School of Government to offer a doctoral degree in public affairs and policy (p.406). For details, see the programdescriptions.

## RESEARCH CENTERS AND INSTITUTES

## Center for Women's Leadership

780 Urban Center
503-725-2895
www.pdx.edu/center-womens-leadership

The Center for W omen's Leadership (CWL) is invested in changing the narrative of leadership in Oregon. CWLhas been a convener of a sustained community network since 2008. Thous ands of individuals have participated in our Power Lunch, events, programming, and supporting the center through mentorship and programdevelopment. CWL currently facilitates an annual six-day program curated for female-identifying and non-binary Oregon college students. NEW Leadership Oreg on (NLO) focuses on educating, ins piring, and cultivating meaningful connections for current and future leaders. CW Loperates as an incubator space to explore new civic capacity building programming for women and gender expansive people in our region. In addition, CWLhosts a variety of events to convene community and amplify the intersectional policy work of Oregon women and gender expansive leaders.

## Institute on Aging

470 Urban Center
503-725-3952
www.pdx.edu/ioa
The Institute on Aging (IOA), in the College of Urban and Public Affairs, is a multidisciplinary research and educational organization. Established in 1969, the IOA was one of the first centers in the United States to focus on the social, psychological, and economic is sues related to aging. Our research is funded by federal, state, and private sources, with projects designed to ad vance knowledge that serves an aging society. TheIOA is actively engaged in community partnerships.

## Our Mission

Institute on Aging faculty, staff, and students are dedicated to enhancing understanding of aging and facilitating opportunities for elders, families, and communities to thrive.

## Research

Institute on Aging faculty specialize in research on a variety of topics, including:

- person-directed long-termcare;
- community-based care, such as assisted living and adult foster home;
- planning, programdevelopment and policies for an aging society;
- aging services and policies;
- applied demography; and
- changing family structures.


## Degree and Training Programs

The Institute on Aging offers courses and areas of specialization in gerontology for postbaccalaureate, master's, and doctoral students, as well as research and teaching opportunities. Each of the educational programs offered provides a multi-dis ciplinary core curriculumin gerontology and is designed for students seeking instruction in aging services, research, and/or policy. The IOA is a member of the Association for Gerontology in Higher Education and the Oreg on Gerontological Association.

## Graduate Programs.

The Graduate Certificate in Gerontology certificate may be completed online. Students from a wide range of disciplines can complement their degree by completing the graduate certificate in gerontology, a post baccalaureate programfor those seeking additional education in aging studies. Examples of degree programs that might be able to add aging as an area of emphasis include Urban Studies, Public Policy, Public Health, Social Work, Speech and Hearing Science, and Business.
The Certificate may be completed as a stand-alone programforstudents who have completed an undergraduate degree.

## Undergraduate Programs.

The OHSU-PSU School of Public Health offers a B.A.in Public Health Studies with a minor in Aging Services. Students fromother undergraduate programs may take gerontology courses offered through this program.

## Lifelong Leaming

The Senior Adult Learning Center (SALC) provides opportunities for continuous intellectual enrichment and personal growth of older adults. Oreg on res idents aged 65 and older can register through the SALC to audit Portland State Univers ity courses on any topic with no tuition costs on a space-available basis.

## Community Service and Partnerships

Through partnerships with a wide variety of organizations that serve older adults locally, regionally, nationally, and internationally, faculty and students at the Institute on Aging seek to build capacity for organizations and communities to address the needs and strengths of older people living near and far. Programs are aimed at enhancing the lives of older persons who lack adequate resources in the United States and in less developed regions of the world. The goal is to test service learning methods and to assess some of the needs of and opportunities for elders in the United States and abroad. Otherservice initiatives focus on creating age-friendly communities and enhancing the quality of long-termcare.

## Population Research Center

780 Urban Center
503-725-3922
www.pdx.edu/prc
Through demographic research and teaching, the Population Research Center (PRC) serves the people of Oregon by addressing the causes and implications of demographic change for communities across the state. PRC is a centerof training and knowledge for solutions to problems in applied demography, including population estimates, projections, geospatial analysis, and censustaking.

## Activities

PRC annually publishes certified population estimates of Oregon's cities and counties, and regular long run population projections for counties and urban growth boundary (UGB) areas. Center faculty collaboratively produce data and research for implementation of policies tied to population or housing to ensure equitable distribution of tax revenue; better land use planning; appropriations for various state and federal programfunds, and for other public policy priorities including housing, land development, education, and public health.

PRC faculty additionally engage in activities including special population es timates or local area censuses, and growth projections or demographic studies for school, library, utility, and other special districts, and technical as sistance with redis tricting.

The center also operates as the Oregon State Data Center (SDC), a cooperative program with the U.S. Census Bureau that makes demographic and socio-economic data and information accessible to state, regional, local, and tribal governments and the public through a network of local experts. SDC collaborates with the Census Bureau to improve the quality of Oregon's databy supporting the decennial census, geographic updates, and other outreach and engagement programs.

As a member of the Federal-State Cooperatives for Population Estimates (FSCPE) and Projections (FSCPP), the PRC is a state liaison with the U.S. Census Bureau for is sues related to population estimates, projections, and the decennial census of housing and population. The center houses historical and current data and maps which are available to faculty, students, and the general public.

## Graduate Programs

The Graduate Certificate in Applied Demography offers specialized training in population studies. Students learn
about the data sources and methodologies used to study population processes, with an emphasis on applications in public policy. The certificate can be completed as a standalone programor integrated into a course of study in any graduate programat PSU.

## DIRECTORIES

## Portland State University Board of Trustees

The Portland State University Board ofTrustees is a 15member volunteer board appointed by the Governor of Oregon. The Board is responsible for the governance of the University as provided in statelaws thatestablish the University. The Board meets at least four times a year. Most of the work of the Board is done through the Board's committees, which meet regularly throughout the year. The members of the Board elect their Chair and Vice Chair, are responsible for the employment and evaluation of the University President, establish the mission and strategic plan of the University, establish tuition and fee rates, approve the University budget and the incursion of debt, and performother tasks as necessary. Allactions of the Board are for the benefit of the University, its current and future students, faculty and staff, the Portland metropolitan area, and the State of Oregon.

The President of the University is an exofficio, non-voting member of the Board. In addition, the Board must include one faculty member, one staff member, and one student from the University. The faculty, staff and student members of the Board are appointed for two-year terms; all other trustees are appointed for four-year terms. Trustees are limited to two full consecutiveterms. All trustees, except for the President, are appointed by the Governor of Oregon, subject to confirmation by the Oregon Senate. A list of the current trustees' terms ofoffice is here.
Current Members of the PSU Board of Trustees

## Portland State University

Faculty members are listed with their programs. The dates in parentheses indicate the beginning of academic service at Portland State University. The earliest date shown is 1955, the year in which Portland State became a degreegranting institution.

## Office of the President

StephenPercy (2014) Ph.D.
President;Professor of Political Science. Ph.D. 1981 Indiana University.

## Office of Athletics

John Johnson (2022) M.S.
Athletic Director. M.S. 1984 Eastern W ashington University.

Office of University Communications
Julie Smith (2000) B.S.
Associate Vice President for Communications. B.S. 1993
Oregon State University.
Brett Forman (2008) B.F.A.
Creative Director. B.F.A. 2001 University of Oregon.
Christina Williams (2020) M.J.
Director of Media and Public Relations. M.J. 1997
University of California, Berkeley.

## Academic Affairs Office of the Provost

Susan Jeffords (2018) Ph.D.
Provostand Vice President for Academic Affairs; Profess or of English and Women Gender and Sexuality Studies.Ph.D. 1981 University of Pennsylvania.
Shelly Chabon (2008) Ph.D.
Vice Provost for Academic Personnel \& Dean of of Interdisciplinary General Education; Professor of Speech and Hearing Sciences. Ph.D. 1980 University of Pittsburgh.

Amy Mulkerin (2021) M.B.A.
Vice Provost for Academic Budget and Planning. International MBA 2001 University of Denver.

Erica Wagner (2009) Ph.D.
Vice Provost forStudent Success; Professor of Bus iness Administration. Ph.D. 2002 London School of Economics.

Vanelda Hopes (2012) M.Ed.
Chief of Staff to the Provost. M.Ed. 1997 Oregon State University.

Andreen Morris (2008) M.P.A.
Curriculum Coordinator. M.P.A. 2013 Portland State University.

Brian Sandlin (2011). B.S.
Accreditation and Compliance Coordinator.B.S. 1998 Appalachian State University.

## Office of Academic Innovation

Michelle Giovannozzi (2016) M.S.
Associate Vice Provost for Academic Innovation. M.S. Human Resource Management 1993 Seattle Pacific University.

Janelle Voegele (1997) Ed.D. Director, Teaching, Learning, and Assessment. Ed.D. 2011 Portland State University.

Raiza Dottin (2018) Ed.D.
Ass ociate Director of Teaching, Learning, \& As sessment. Ed.D. 2018 University of Portland.
Molly A. Griffith (2008) M.S.
Associate Director for Digital Learning Environments.
M.S. 2008 Portland State University.

Scott Robis on (2016) Ph.D.
Associate Director of DigitalLearning and Design. Ph.D. 2007 Ohio University.

Kevin Berg (2016) J.D.
Ass istant Director of Online ProgramManagement. J.D. 1997 University of W ashington.

Sarah Berry (2020) Ph.D.
Academic Technology Support Coordinator. Ph.D. Film Studies 1996New York University.
Kale Brewer (2013) B.A.
Instructional Multimedia Developer.B.A. 2012 Portland State University.

Emily Connelly (2019) B.A.
Instructional Multimedia Coordinator. B.A. 2005 Portland State University.

Kari Goin (2014) M.F.A.
Senior UX Des igner. M.F.A. 2013 University of Montana.
Aifang Gordon (2007) Ph.D.
Instructional Designer. Ph.D. 2007 Ohio University.
Misty Hamideh (2003) M.A.
Instructional Designer. M.A. 2003 Portland State University.
Andrew F. Lawrence (2014) M.A.
Course Support-Information Technology Specialist. M.A. 2014 Portland State University.

Kam-MoiLee (2020) Ed.D.
Instructional Designer. Ed.D 2019 Concordia University.
Marie S. Lewandowski (2003) M.Ed.
Instructional Designer. M.Ed. 1997 Kent State University.
Harold McNaron (2021) M.S.
Teaching, Learning, and Assessment Associate. M.S. 2013 Portland State University.

Megan McFarland (2021)M.Ed.
Digital Inclusion \& Univers al Design Coordinator. M.Ed.
Inclusive Secondary Education 2015 Humboldt State
University.
Michael Millard (2011) B.A.
Administrative Program Assistant. B.A. 1992 Briar Cliff University.

Lindsay Murphy (2017) M.A.
Instructional Designer. M.A. Literature \& Language, emphas is:Teaching English at Community College 2012 Marymount University.
Toai Nguyen (2014) B.S.
UX Designer. B.S. 2007 Portland State University.
Julie Savage-Lee (2019)
Instructional Technical Specialist. B.A. 2005 Emers on College.
Vince Schreck (2005) Ed.D.
InstructionalDesigner. Ed.D. 2004 Portland State University.
Sophie Soprani (2017) B.A.
Marketing and Communication Manager. B.A. 2015
Pomona College.
Mark Terui (2010) M.A.
Instructional Designer. M.A. 2001 Pepperdine University.
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ProgramManager for Educational Initiatives. M.F.A. 2010
Eastern W ashington University.

## Advising and Career Services

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Director, Trans fer \& Returning Student ResourceCenter \& ProgramDirector, Office of Student Success - M.S.Ed 2013 Portland State University.

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Advising Director- Urban, Public, and Global Affairs
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Office of Global Engagement and Innovation
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University of Michigan.
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International Scholar \& Faculty Adviser. B.A. 1985
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International Student Advisor, International Student \&
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Associate Director of International StudentLife. M.S.
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ProgramManager, Portland Center. M.S. 2011 Portland
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## Learning Center

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Library
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Education and Science Librarian, Assis tant Professor. M.L.I.S. 2000 University of Texas at Austin.

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Urban \& Public Affairs Librarian, As sociate Professor. M.L.S. 2007 Indiana University-Bloomington; M.I.S. 2007 Indiana University-Bloomington.
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2009 Emporia State University.
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## Emeriti Faculty

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Profess or Emerita. M.L.S. 1997 Emporia State University.
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Profess or Emeritus. M.S. 1979 Portland State University.
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Associate Professor Emerita. M.L.S. 1965 Pratt Institute.
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Profess or Emerita. M.A. 1977 University of Washington.
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Associate Professor Emeritus. M.Libr. 1969 University of Washington.
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University Librarian Emeritus. M.L.S. 1966 University of California, Berkeley.

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Profess or Emerita. M.A. 1982 San Francisco State
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Profess or Emerita. M.L.S. 1972 University of Oregon.

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Profes sor Emeritus. M.L.S. 1995 Syracuse University.
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Profes s or Emerita. M.A. 1976 Long Island University.
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Profes sor Emeritus.M.L.S. 1971 University of Oregon.
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Case Manager. M.S.W. 2011 University of Pennsylvania.
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RN2 Laboratory, Vaccine, \& X-Ray Coordinator. M.S.N.
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Wellbeing and Health Promotion Coordinator. M.P.H. 2015 East Carolina University.

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George Fox University.
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Dental Clinic Manager; Dental Assistant.
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Clinical Social Worker. M.S.W. 2010 Smith College SchoolforSocial Work.

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Psychiatrist. M.D. 2000 Oregon Health and Science University.

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Insurance Coordinator, Student Health Insurance Program. B.S. 1993 Blooms burg University.

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Registered Nurse. B.S. 2004 University of Oregon.
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Queer Resource Center
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Women's Resource Center
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## Enrollment Management

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## Student Financial Aid and Scholarships

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## Finance and Administration

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Treasurer and University Debt Manager. M.S.Ec. 2005
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University Risk Manager. J.D. 2002 Louisiana State University.
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## Campus Public Safety

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## Human Resources

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## Student Financial Services

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## University Budget Office

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## University Risk Management

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Director, Contracts \& Procurement. J.D. 1982 Lewis and Clark Law School.

## Office of General Counsel

Cynthia J. Starke (2014) J.D.
General Counsel and Secretary to the Board of Trustees.
J.D. 2000 Harvard Law School.

Michael J. Grieser (2011) J.D.
Assistant General Counsel. J.D. 2003 Lewis \& Clark Law School.

Jeremy S. Healey (2019) J.D.
Assistant General Counsel, J.D. 2008 University of Oregon School of Law.

Krista S. Stearns (2014) J.D.
Assistant General Counsel. J.D. 1992 University of Minnesota Law School.

## Global Diversity and Inclusion

Ame Lambert (2020) Ph.D.
Vice President for Global Diversity \& Inclusion. Ph.D. 1997 University of Texas at Tyler.
Julie Caron (2011) J.D.
As sociate Vice President for Global Divers ity \& Inclusion; Title IX Coordinator. J.D. 1989 Northwestern School of Law, Lewis and Clark College.

Diversity and Multicultural Student Services
Perla Pinedo (2003) M.A.
Director, Retention Programs. M.A. 2008 Portland State University.
Cynthia Gómez (1999) M.S.
Executive Director of Cultural Resource Centers for Diversity and Multicultural StudentServices; Faculty, University Studies \& Public Adminis tration. M.S. 2001 Portland State University.

Linda L. Liu (2008) M.A.
ProgramDirector, TRiO - StudentSupport Services. M.A.
1998 University of Oregon.
R. Philip Dirks (1989) M.A.

Project Director of Educational Talent Search and Upward Bound. M.A. 1983 Iowa State University.

Jen Dugger (2012) M.A.
Director, Dis ability Resource Center. M.A. 2005 Southeast Mis souri State University.

Director and Managing Attorney - Student Legal Services. JD. 1972 University of Oregon Schoolof Law.

## Office of Information Technology

Kirk Kelly (2011) M.S.
Vice Presidentfor Information Technology and CIO. M.S.

- M.I.S. 2006 University of Phoenix.

Ryan Bass (2005) M.B.A.
Associate CIO, Technology Infrastructure. M.B.A. 2009
Portland State University.
Sean McKay (2013) M.Ed.
Chief Information Security Officer. M.Ed. 2007 George Fox University.
Jerrod Thomas (2004) M.S.
Senior Director, Academic \& Technology Services. M.S. 2015 Portland State University.
Michele Webber (2016) B.S.
Finance and Operations Associate Director. B.S. 1990 Cal
State Univers ity Dominguez Hills.

## Office of Institutional Research and Planning (OIRP)

Kathi A. Ketcheson(1985) Ph.D.
Director, Institutional Research and Planning; Research
Professor. Ph.D. 1996 Portland State University.
David Burgess (1999) M.S.
Associate Director, Institutional Research and Planning. M.S. 1996 Portland State University.

MichaelSmith (2017) M.S.
Senior Institutional Research Analyst, Institutional
Research and Planning. M.S. 2017 Marshall University.
Zach Markis s (2013) M.S.
Research Analyst, Institutional Research and Planning. M.S. 2009 Univers ity of Idaho.

Allyson Meyers (2021) M.S.
Research Analyst, Institutional Research and Planning. M.S. 2021 Portland State University.

## Research \& Graduate Studies

Jas on Podrabsky (2003)Ph.D.
Interim Vice President for Research \& Graduate Studies. Ph.D. 1999 University of Colorado at Boulder.

Kelly Clifton (2010) Ph.D.
Interim Ass ociate Vice President for Research. Ph.D. 2001 University of Texas at Austin.

Joseph Janda (2008) M.B.A.
Assistant Vice President for Research. M.B.A. 2015

Portland State University.
Dawn Boatman (2008) M.P.A.
Assistant Vice President of Research Adminis tration.
M.P.A. 1994 University of North Florida.

Jennifer Ward (2012) B.A.
Director of Spons ored Projects Operations. B.A. 2003
University of Colorado at Boulder.
Shannon Roth (2014) E.M.P.A.
Director of Research Integrity \& Compliance Operations. E.M.P.A. 2017 Portland State University.

Brandon Barnhill (2015) B.S.
Director of Export Controls and Research Security. B.S. 2010 Eastern Oregon University.

Travis Woodland (2018) M.S.
Director of Innovation \& Intellectual Property. M.S. 2011 University of Idaho.

Arsh Haque (2021) J.D.
Director of the Portland State Bus iness Accelerator. J.D. 2021 Univers ity of Southern California.

Margaret Rea (2015) M.B.A.
Senior Fiscal Officer for Research \& GraduateStudies. M.B.A. 2020 Portland State University.

Amy Spring (1997) M.P.A.
Director of Project Management and Communications, Research Development. M.P.A. 1997 Portland State University.

## The Graduate School

Rossitza B. Wooster (2002) Ph.D.
Dean of the Graduate School; Professor of Economics.
Ph.D. 2002 University of Oregon.
Mark Woods (2008) Ph.D.
Associate Dean of the Graduate School; Associate Profes sor of Chemistry. Ph.D. 1998 University of Durham, England.

Kelly Doherty (2007) M.P.A.
Director of Graduate Admissions. M.P.A. 2010Portland State University.

Courtney AnnHanson (2005) M.S.
Director of Graduate Academic Services. M.S. 2012
Portland State University.

University Research Centers and Institutes
Center for Electron Microscopy and Nanofabrication
Greg Baty (2009) B.S.
Manager. B.S. 2009 Portland State University.
Center for Interdisciplinary Mentoring Research
Thomas Keller (2006) Ph.D.
Director.Ph.D. 2000 University of Washington.
Digital City Testbed Center
Jonathan Fink (2010) Ph.D.
Director. Ph.D. 1979 Stanford University.
Homelessness Research and Action Collaborative
Maris a Zapata (2013) Ph.D.
Director.Ph.D. 2009 University of Illinois Urbana-
Champaign.
Jacen Greene (2011) M.B.A.
Assistant Director. M.B.A. 2009 Portland State University.
Institute for Sustainable Solutions
Fletcher Beaudoin (2009) M.P.A.
Director. M.P.A. 2009 Columbia University.
Transportation Research and Education Center
Jennifer Dill (2001) Ph.D.
Director. Ph.D. 2001 University of California, Berkeley.
Hau Hagedorn (2006) M.P.A.
Associate Director. M.P.A. 2020 Portland State University.

## University Relations

Kevin Neely (2017) B.S.
Vice President for University Relations. B.S. 1996
Portland State University.
Alys on Kraus (2011) B.A.
Director of State Government Relations. B.A. 2008
University of Oregon.

## Portland State University Foundation

Created in 1963, the PSU Foundation raises philanthropic gifts, inves ts themresponsibly, and stewards themin accordance with donors' wishes. The PSUFoundation is responsible for raising and managing private res ources to support the mis sion and priorities of the university and contributes to institutional excellence.

Current PSU Foundation Staff

## Academic Faculty

Faculty members are listed with their programs. The dates in parentheses indicate the beginning of academic service
at Portland State University. The earliest date shown is 1955, the year in which Portland State became a degreegranting institution.

## College of the Arts

Leroy E. Bynum, Jr. (2017) D.M.A.
Dean, College of the Arts; Professor of Music. D.M.A. 1992 University of Georgia.
Barbara Heilmair (2007) D.M.A.
Associate Dean, College of the Arts;Professor of Music. D.M.A. 2004 University of California Los Angeles.

## School of Architecture

Faculty
L. Rudolph Barton (1988) M.Arch.

Emeritus Profess or of Architecture. M.Arch. 1981 Harvard University.

Travis Bell (2012) M.Arch.
Associate Professor of Architecture. M.Arch. 2006
University of Washington.
Todd Ferry (2013) M.Arch.
Senior Research Associate. M.Arch. 2013 University of Texas at Austin.
Anna Goodman (2016) Ph.D.
Assistant Professor of Architecture. Ph.D. 2015 University of California, Berkeley.

Juan Heredia (2010) Ph.D.
Associate Professor of Architecture. Ph.D. 2008 University of Pennsylvania.

Anahita Khodadadi (2019) Ph.D.
Ass istant Professor of Architecture. Ph.D. 2019 University of Michigan.
Clive Knights (1995) M.Phil.
Profes sor of Architecture. M.Phil. 1988 University of Cambridge.
Margarette Leite (2008) M.Arch.
Profes s or of Architecture. M.Arch. 1990 University of Pennsylvania.

Sergio Palleroni (2008) M.S.Arch.
Profes s or of Architecture. M.S.Arch. 2006Mass achusetts Institute of Technology.

Andrew Santa Lucia (2016) M.A.
Assistant Professor of Practice. M.A. 2012 University of Illinois at Chicago.
Jeff Schnabel(2007) M.Arch.
Director, School of Architecture; Professor of Architecture. M.Arch. 1990 University of Pennsylvania.

Laila Seewang (2019) Ph.D.
Assistant Professor of Architecture. Ph.D. 2019
EidgenössischeTechnische Hochschule Zürich.

Barbara A. Sestak (1982) M.Arch.
Profess or of Architecture. M.Arch. 1977 University of Washington.
Aaron Whelton (2010) M.Arch.
Associate Professor of Architecture. M.Arch. 2002
University of California, Los Angeles.
School of Art + Design
Faculty
Kate Bingaman-Burt (2008) M.F.A.
Profess or of Art. M.F.A. 2004 Univers ity of Nebraska.
Lis Charman (2000) M.F.A.
Director, School of Art+Design; Professor of Art. M.F.A. 1992 California Institute of the Arts.
EleanorH. Erskine (1995) M.F.A.
Professor of Art. M.F.A. 1988 Cranbrook Academy of Art.
Harrell Fletcher (2004) M.F.A.
Profess or of Art. M.F.A. 1994 California College of the Arts.

Erik Geschke (2007) M.F.A.
Profess or of Art. M.F.A. 2001 Mary land Institute College of Art.
Alis on Heryer (2013) M.F.A.
Associate Professor of Art. M.F.A. 2010 Univers ity of Texas at Austin.

Thomas Hines (2012) M.F.A.
Associate Professor of Art. M.F.A 2012 Parsons the New School.
M. Michelle Illuminato (2016) M.F.A.

Associate Professor of Art. M.F.A 1996 University of Wisconsin.

Meredith James (2014) M.F.A.
Associate Professor of Art. M.F.A. 2008 Cranbrook
Academy of Art.
Lisa Jarrett (2013) M.F.A.
Ass ociate Professor of Art. M.F.A. 2009 The University of Montana.
J. Stephen Lee (2017) M.F.A.

Assistant Professor of Graphic Design. M.F.A. 2010
California Institute of the Arts.
Junghee Lee (1995) Ph.D.
Profess or of Art His tory. Ph.D. 1984 University of
California, Los Angeles.
Briar Levit (2012) M.A.
Associate Professor of Art. M.A. 2005 Central Saint Martins College of Art and Design. London.
Jesse Locker (2009) Ph.D.
Profess or of Art History. Ph.D. 2007 Johns Hopkins University.

Anne McClanan (1999) Ph.D.
Profes s or of Art History. Ph.D. 1997 Harvard University.
Alberto McKelligan Hernández (2017) Ph.D.
Assistant Professor of Art History. Ph.D. 2017 City
University of New York.
Julie Perini (2011) M.F.A.
Profes s or of Art. M.F.A. 2006 Univers ity at Buffalo.
Ralph Pugay (2016) M.F.A.
Assistant Professor of Art. M.F.A. 2010 Portland State University.

Carmen Ripollés (2013) Ph.D.
As sociate Professor of Art. Ph.D. 2010 University of Illinois at Urbana-Champaign.
Sean Schumacher (2019) M.F.A .
Assistant Professor of Art. M.F.A. 2012Portland State University.
garima thakur (2021) M.F.A.
Ass istant Professor of Art. M.F.A. 2011 University of Florida.
Emeriti Faculty
Lisa F. Andrus-Rivera (1976) Ph.D.
Profess or Emerita of Art History. Ph.D. 1976 Columbia University.

Patricia Boas (2010) M.F.A.
Profes sor Emerita of Art. M.F.A. 2000 Portland State University.

Horia Boboia (2001) M.F.A.
Profess or Emeritus of Art. M.F.A. 1985 California Institute of the Arts.

Craig G. Cheshire (1964) M.F.A.
Profes sor Emeritus of Art. M.F.A. 1961 University of Oregon.
Charles Colbert (2000) Ph.D.
Assistant Professor Emeritus of Art History. Ph.D. 1978 Harvard University.

Mary A. Constans (1968) M.S.
Profes sor Emerita of Art. M.S. 1965 Univers ity of Oregon.
Walton B. Fosque (1984) M.A.
Profes sor Emeritus of Art. M.A. 1973 California State University, Long Beach.
Jean K. Glazer (1959) M.A.
Profes s or Emerita of Art. M.A. 1948 Institute of Design, Illinois Institute of Technology.

James L. Hansen (1964) Cert-Fine Arts
Profes sor Emeritus of Art. Cert-Fine Arts 1951 Portland MuseumArt School.

Susan J. Harlan (1992) M.F.A.
Profes s or Emerita of Art. M.F.A. 1975 University of Miami.

James S. Hibbard (1967) M.A.
Profess or Emeritus of Art. M.A. 1966 University of Iowa.
L. Robert Kasal(1964) M.A.

Profess or Emeritus of Art. M.A. 1969 University of California, Berkeley.
Melvin Katz(1966) Cert-Fine Arts
Profess or Emeritus of Art. Cert-Fine Arts 1953 Cooper Union.

Jane Kristof(1973) Ph.D.
Profess or Emerita of Art History. Ph.D. 1972 Columbia University.

Robert Morton (1963) M.F.A.
Profess or Emeritus of Art. M.F.A. 1957 Univers ity of
Washington.
Daniel Pirofsky (1998) B.A.
Assistant Professor Emeritus of Art. B.A. 1989 Naropa Institute.

Rita J. Robillard (1999) M.F.A.
Profess or Emerita of Art. M.F.A. 1981 University of California, Berkeley.
Sue Taylor (1997) Ph.D.
Profess or Emerita of Art History. Ph.D. 1997 University of Chicago.

Emily L. Young (1987) M.Ed.
Profess or Emerita of Art. M.Ed. 1964 University of Florida.

## School of Music \& Theater

Faculty
Devon Allen (2005) M.F.A.
Profess or of Theater Arts (acting). M.F.A. 1992 University of California, San Diego.

Sherry Alves (2017) M.M.
Instructor of Music (jazz voice). M.M. 2009 Western Oregon University.

Harry Baechtel (2015) D.M.A.
Associate Professor of Music (voice). D.M.A. 2014
University of Oregon.
David Bamonte (2007) M.M.
Associate Professor of Music (trumpet). M.M. 1986New
England Conservatory of Music.
Antares Boyle (2019) Ph.D.
Assistant Professor of Music (theory). Ph.D. 2018
University of British Columbia.
Sydney Carls on (2008) D.M.A.
Profess or of Music (flute). D.M.A. 1996 University of Houston.

Susan Chan (2004) D.M.A.

Profes sor of Music (piano). D.M.A. 1994 Indiana
University.
Hamilton Cheifetz (1977)
Profes sor of Music (cello).
George Colligan (2011) M.A.
Profess or of Music (jazz). M.A. 2007 Queens College.
Tomas Cotik (2016) D.M.A.
As sociate Professor of Music (violin). D.M.A. 2013
University of Miami.
Charles Dillard (2016) D.M.A.
Associate Professor of Music (collaborative piano). D.M.A. 2009 University of Colorado-Boulder.

Darrell Grant (1997) M.M.
Profes s or of Music (jazz). M.M. 1986 University of Miami.

Barbara Heilmair (2007) D.M.A.
Profes s or of Music (clarinet, mus ic his tory). D.M.A. 2004
University of California Los Angeles.
Edward Higgins (2005) D.M.A.
Profes sor of Music (online classes). D.M.A. 2000
University of Mis souri-Kansas City.
Li Kuang (2021) D.M.A.
Assistant Professor of Music (trombone \& theory). D.M.A. 2016 The University ofTexas, Austin.
Karin Magaldi(1999) M.F.A.
As sociate Director, Theater; Professor of Theater Arts (play writing). M.F.A. 1980 Univers ity of California, Los Angeles.
Jesse McCann (2015) M.M.
Senior Instructor of Music (guitar). M.M. 2007 Portland State University.
Bonnie Miksch (2004) D.M.A.
Director, School of Music \& Theater; Professor of Music (composition). D.M.A. 1998 University of Cincinnati.

Caroline Miller (2021) Ph.D.
Assistant Professor of Music (technology). Ph.D. 2019
University of California, San Diego.
Kelley Nassief (2022) M.V.P.
Assistant Professor of Music (opera \& voice). M.V.P. 2014
WestminsterChoirCollege.
MariSchay (2021) M.M., M.A.T.
Assistant Professor of Music (music education). M.M.
1994 University of Cincinnati.
Jelena Schiff(2015) D.M.A.
As sociate Professor of Music (musicology). D.M.A. 2012 Boston University.

Ken Selden (2006) D.M.A.
Profes sor of Music (orchestra). D.M.A. 2005 Peabody Conservatory.

Ethan Sperry (2010) D.M.A.
Profess or of Music (choirs).D.M.A. 2000 University of Southern California.
Karen L. Strand (1989) M.M.
Associate Professor of Music (oboe).M.M. 1982 Eastman School of Music.

Richard J. W attenberg (1990) Ph.D.
Profess or of Theater Arts (theater history). Ph.D. 1979
University of Wis consin, Madison.
Solomon Weis bard (2021) M.F.A.
Ass istant Professor of Theater Arts (design). M.F.A. 2013
Yale School of Drama.
Anwyn Willette (2015) M.M.
Senior Instructor of Music (theory, technology). M.M. 2004 Portland State University.
Emeriti Faculty
Sarah Andrews-Collier (1981) M.A.
Profess or Emerita of Theater Arts. M.A. 1996 University of London (U.K.).

Ronald D. Babcock (1988) D.M.A.
Profess or Emeritus of Music. D.M.A. 1993 Univers ity of North Texas.

JoelBluestone(1989) D.M.A.
Profess or Emeritus of Music (percussion). D.M.A. 1987
State Univers ity of New York, Stony Brook.
Bruce S. Browne (1978) D.M.A.
Profess or Emeritus of Music.D.M.A. 1976 Univers ity of Washington.
Jack Lee Featheringill (1970) M.A.
Profess or Emeritus of Theater Arts. M.A. 1970 Indiana University.

Glenn G. Gauer (1977) M.F.A.
Profess or Emeritus of Theater Arts. M.F.A. 1973
Carnegie-Mellon University.
Debbie Glaze (2003) M.M.
Profess or Emerita of Music. M.M. 1985 San Jose State University.
Charles Gray (1988). M.M.
Profess or Emeritus of Music (jazz). M.M. 1988 North Texas State University.
Bradley H. Hansen (2002) D.A.
Profess or Emeritus of Music (theory). D.A. 1985
University of Northern Colorado.
David Jimers on (1983) M.M.
Associate Professor Emeritus of Music.M.M. 1972
University of Arizona.
Mary H. Kogen (1979) M.M.
Profess or Emerita of Music. M.M. 1968 Northwestern University.

Stephen H. Martin (1991) Ph.D.
Profes sor Emeritus of Music. Ph.D. 1980 University of W ashington.
Christine Meadows (2006) M.M.
Profes sor Emerita of Music. M.M. 1985 Indiana State University.

Judy Patton (1978) M.A.
Profes sor Emerita of Dance. M.A. 1996 Reed College.
Wilma F. Sheridan (1959) Ph.D.
Dean Emerita, College of the Arts; Professor Emerita of Music.Ph.D. 1979 Univers ity of Oregon.
Marilyn W. Shotola (1981) D.M.A.
Profes sor Emerita of Music (flute). D.M.A. 1989
University of North Texas.
Carol Sindell(1977) B.M.
Profess or Emerita of Music (violin). B.M. 1969 Oberlin College.

Gordon A. Solie (1960) M.M.
Profess or Emeritus of Music.M.M. 1968 University of Arizona.
William P. Stalnaker, Jr. (1968) Ph.D.
Profes sor Emeritus of Music. Ph.D. 1968 Princeton
University.
Thomas S. Stanford (1981) D.M.A.
Profes s or Emeritus of Music. D.M.A. 1983 University of Oregon.

Tomas Svoboda (1970) M.M.
Profes s or Emeritus of Music. Prof. M.M. 1969 University of Southern California.

William Tate (1968). M.A.
Profes sor Emeritus of Theater Arts. M.A. 1967 University of Birmingham (U.K.).
Pat Vandehey (2017) M.S.
Associate Professor Emeritus of Music (band and music education). M.S. 1988 Portland State University.
Gerald Webster (1994) M.M.
Profes s or Emeritus of Music. M.M. 1966 Indiana University.

School of Film
Faculty
Mark Berrettini (2007) Ph.D.
Profes sor of Film. Ph.D. 2000 University of Rochester.
Amy E. Borden (2012) Ph.D.
Associate Professor of Film. Ph.D. 2010 University of Pittsburgh.
Nancy Breaux (2019) Ph.D.
Instructor of Film. Ph.D. 1993 University of Oregon.
Eliza (Amy) Greenstadt (2001) Ph.D.

Profess or Emeritus of Film. Ph.D. 2000 University of California, Berkeley.
Courtney Hermann (2015) M.F.A.
Director, School of Film; As sociateProfessor of Film. M.F.A. 2000 Columbia College Chicago.

Kristin Hole (2014) Ph.D.
Associate Professor of Film. Ph.D. 2014 Stony Brook
University, The State University of New York.
Jungmin Kwon (2016) Ph.D.
Associate Professor of Film and DigitalCulture. Ph.D. 2014 University of Illinois at Urbana-Champaign.
Ben Mendelsohn (2020) Ph.D.
Assistant Professor of Film and DigitalCulture. Ph.D. 2018 New York University.
Dustin Morrow (2011) M.F.A.
Profess or of Film. M.F.A. 2003 Univers ity of Iowa.
Ricardo Pinheiro (2022) M.F.A.
Instructor of Film. M.F.A. 2014 California State University Los Angeles.
Jennifer Ruth (1999) Ph.D.
Profess or of Film. Ph.D. 1999 Brown University.
Juan Jose (J.J.) Vazquez (2019) M.F.A.
Instructor of Film. M.F.A. 2018 California State University
Los Angeles.

## The School of Business

Cliff Allen (2008) Ph.D.
Dean, The School of Business. Ph.D. 2010 Gonzaga University.

Accounting
Faculty
Elizabeth Almer (2001) Ph.D., C.P.A.
Retzlaff Director in Accounting, Professor of Business
Administration. Ph.D. 1996 Arizona State University.
John Eckroth (2014) M.B.A.
Senior Instructor I of Busines s Administration. M.B.A. 2007 Portland State University.
Cass Hausserman (2014) Ph.D.
Associate Professor of Business Adminis tration. Ph.D. 2014 University of Wis consin-Madis on.
Matthew Kaufman (2016) Ph.D.
Assistant Professor of Business Administration. Ph.D. 2016 University of Wis consin-Madis on.

Joleen Kremin (2014) Ph.D.
Associate Professor of Bus iness Adminis tration. Ph.D. 2014 Texas Tech University.

Kelly Lutz (2014) M.S.
Instructor of Business Adminis tration. M.S. 1998 W alsh College.
JoelOwens (2018) Ph.D.
Assistant Professor of Business Administration. Ph.D.
2015 University of South Carolina.
Madelyn Parsons (2018) M.A.
Instructor of Business Adminis tration. M.A. 2016 Auburn
University.
Kathy HertzRupley (2006) Ph.D., C.P.A.
As sociate Professor of Bus iness Adminis tration. Ph.D. 2006 University of W ashington.
Mike Schuster (2002) M.B.A.
Senior Instructor I of Business Adminis tration. M.B.A. City University, C.M.A.

Kristi Yuthas (1999) Ph.D.
Swigert Profes sor in Information Systems; Professor of Business Adminis tration. Ph.D. 1990 University of Utah. Emeriti Faculty
Darrell Brown (1994) Ph.D., C.P.A.
Profes sor Emeritus of Business Administration. Ph.D. 1994 University of Utah.

Jesse Dillard (2003) Ph.D.
Profes sor Emeritus of Business Administration. Ph.D. 1976 University of South Carolina.

MichaelR. Gaines (1965) Ph.D., C.P.A.
Profes sor Emeritus of Business Administration. Ph.D. 1969 Univers ity of W ashington; C.P.A.
H. Thomas Johnson (1988) Ph.D.

Profes sor Emeritus of Business Administration. Ph.D. 1969 University of W is consin.
Raymond N. Johnson (1980) Ph.D.
Profes sor Emeritus of Business Adminis tration. Ph.D. 1981 University of Oregon.

Donna R. Philbrick (1984) Ph.D., C.P.A.
Profes s or Emerita of Business Administration. Ph.D. 1984 Cornell University.
Richard Sapp (1978) Ph.D., C.P.A.
Profes sor Emeritus of Business Administration.Ph.D. 1978 University of Houston.
Richard H. Visse (1976) Ph.D., C.P.A.
Profes sor Emeritus of Business Administration. Ph.D. 1974 Arizona State University; C.P.A.

## Finance

Faculty
MichaelDimond (2012) M.S.
Senior Instructor I of Bus ines s Administration. M.S. 2007 Portland State University.

Julia Freybote (2019) Ph.D.
Assistant Professor of Bus iness Administration. Ph.D. 2012 Georgia State University.

Janet Hamilton (1986) Ph.D.
Associate Professor of Business Administration. Ph.D. 1986 Michigan State University.

Qin Lian (2015) Ph.D.
Cameron Profess or in Finance; Associate Professor of Business Adminis tration. Ph.D. 2007 University of Alabama.

Piman Limpaphayon (2011) Ph.D.
Associate Professor of Business Administration. Ph.D 1998 University of Rhode Island.

Gerard C.S. Mildner (1991) Ph.D.
Associate Professor of Business Administration. Ph.D. 1991 New York University.
Daniel A. Rogers (2001) Ph.D.
Associate Professor of Business Administration. Ph.D. 1998 University of Utah.

Jing Zhao (2016) Ph.D.
Associate Professor of Business Administration. Ph.D. 2007 Pennsylvania State University Emeriti Faculty

Chi-Cheng Hsia (1987) Ph.D.
Profess or Emeritus of Business Adminis tration. Ph.D. 1974 University of California.

James H. Hug on (1962) Ph.D.
Profess or Emeritus of Business Adminis tration.Ph.D. 1964 University of Washington.
Shafiqur Rahman (1986) Ph.D.
Profess or Emeritus of Business Adminis tration. Ph.D. 1986 University of Illinois.
John W. Settle (1984) Ph.D.
Associate Professor Emeritus of Business Administration.
Ph.D. 1978 University of W ashington.
Management
Faculty
Melissa Appleyard (2003) Ph.D.
Ames Profes sor in Management of Innovation and Technology; Professor of Business Administration. Ph.D. 1997 University of California, Berkeley.
Talya N. Bauer (1994) Ph.D.
Cameron Profess or in Management; Professor of Business Administration. Ph.D. 1994 Purdue University.

David Cadiz (2015) Ph.D.
Sr. Instructor I of Bus iness Administration. Ph.D. 2015 Portland State University.

David Caughlin (2015) Ph.D.
Sr. Instructor I of Bus iness Administration. Ph.D. 2015 Portland State University.
Jeanne Enders (2000) Ph.D.
Assistant Professor of Business Administration. Ph.D. 1997 University of Chicago.

Berrin Erdogan (2002) Ph.D.
Profes sor of Business Administration. Ph.D. 2002
University of Illinois, Chicago.
Brady Firth (2018) Ph.D.
Assistant Professor of Business Administration. Ph.D. 2014 University of Maryland.
David Garten (2005) M.B.A., M.S.
Caps tone ProgramDirector. M.B.A. 1987 M.I.T., Sloan School of Management;M.S. Engineering 1985 Rens selaer Polytechnic Institute.
David L. Hansen (1999) M.B.A.
Senior Instructor II in Business Administration. M.B.A. 1997 Portland State University.
StantonHeister (2018) DBA.
Instructor of Business Adminis tration. DBA 2015 Argosy University.

Tien M. James (2004) D.O., M.B.A.
Assistant Professor of Business Administration. M.B.A. 1997 William Woods University.
Bill Jones (2009) Ph.D.
Business CapstonePartnership Coordinator. Ph.D. 1985 Columbia University.

Sejin Keem (2017) Ph.D.
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Tulane; Habilitation 1998 Freie Universitát Berlin.
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Profes s or of Physics. Ph.D. 1996 North Carolina State University.

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Profes or of Physics. Ph.D. 1982 State University of New York, Buffalo.
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Profess or of Physics. Ph.D. 1987 University of Oregon.
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Profess or of Physics. Diploma 1983 Leipzig University;
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Profes sor of Physics. Ph.D. 1996 University of Minnesota.
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Chair, Associate Professor of Physics. Ph.D. 2002
University of California, Irvine.
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Director, Applied Physics Ph.D. Program; Associate
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Profess or of Physics. Ph.D. 1982 Colorado State
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Profes sor of Physics. Ph.D. 1986 University of Oregon.
Ralf Widenhorn (2005) Ph.D.
Profes sor of Physics. Ph.D. 2005 Portland State University.
Emeriti Faculty
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Profes sor Emeritus of Physics. Ph.D. 1975 University of Rochester.

Carl Bachhuber (1963)Ph.D.
Associate Professor Emeritus of Physics. Ph.D. 1965
University of Washington.
Erik Bodegom(1984) Ph.D.
Profes sor Emeritus of Physics. Ph.D. 1982 Catholic
University of America.
Donald G. Howard (1965) Ph.D.

Profess or Emeritus of Physics. Ph.D. 1964 University of California, Berkeley.
Mohammad AslamKhan Khalil(1995) Ph.D.
Profess or Emeritus of Physics. Ph.D. 1976 University of Texas; Ph.D. 1979 Oregon Graduate Center, Beaverton.
Arnold D. Pickar (1963) Ph.D.
Profess or Emeritus of Physics. Ph.D. 1962 University of Maryland.
Pieter K. Rol (1992) Ph.D.
Profess or Emeritus of Physics. Ph.D. 1960 University of Amsterdam(The Netherlands).
Jack S. Semura (1973) Ph.D.
Profess or Emeritus of Physics. Ph.D. 1972 University of Wisconsin.

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Assistant Professor of Psychology. Ph.D. 2015 Rutgers University.
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Profess or of Psychology. Ph.D. 2000 Harvard University.
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Assistant Professor of Psychology. Ph.D. 2015 Portland State University

Jennifer K. Dimoff (2016) Ph.D.
Assistant Professor of Psychology. Ph.D. 2016 Saint Mary's University (Canada).
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Assistant Professor of Psychology. Ph.D. 2016 Univers ity of California, Santa Barbara.
Charlotte Fritz (2009) Ph.D.
Associate Professor of Ps ychology.Ph.D. 2005 Technical University of Braunschweig.
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Senior Instructor II. Ph.D. 2001 Oregon Health \& Science University.
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Associate Professor of Ps ychology. Ph.D. 2010 University of California, Los Angeles.
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Profess or of Psychology.Ph.D. 1985 University of South Florida.
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Profess or of Psychology. Ph.D. 1986 Free University of Berlin (Germany).

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Profes sor of Psychology. Ph.D. 1997 University of Illinois at Urbana-Champaign.
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Associate Chair, Associate Professor of Psychology. Ph.D. 2012 Rice University.

Andrew J. Mashburn (2011) Ph.D.
Chair, Department of Ps ychology; Professor of
Psychology. Ph.D. 2004 Georgia State University.
Cynthia Mohr (2001) Ph.D.
Profes sor of Psychology. Ph.D. 1999 University of Connecticut.

Jason Newsom (1996) Ph.D.
Profes sor of Psychology. Ph.D. 1993 Arizona State University.
C. Kerth O'Brien (1987) Ph.D.

Profes sor of Psychology. Ph.D. 1987 University of Michigan.

Marcus Sharpe (2020) Psy.D.
Senior Ins tructor I. Ps y.D. 2003 California School of
Professional Psychology.
Ellen A. Skinner (1992) Ph.D.
Profes sor of Psychology. Ph.D. 1981 Pennsylvania State University.
JoelS. Steele (2011) Ph.D.
Associate Professor of Ps ychology. Ph.D. 2011 University of California, Davis .

Greg Townley (2012) Ph.D.
Profes sor of Psychology. Ph.D. 2012 University of South Carolina.

Liu-Qin Yang (2009) Ph.D.
Profes s or of Psychology. Ph.D. 2009 University of South
Florida.
Emeriti Faculty
Sherwin Davidson (1989) Ph.D.
Profes or Emeritus of Psychology. Ph.D. 1978 University of Utah.
Gerald Guthrie (1970) Ph.D.
Profes s or Emeritus of Psy chology. Ph.D. 1966 Clark
University.
Janice K. Haaken (1979) Ph.D.
Profes or Emerita of Ps ychology. Ph.D. 1979 Wright
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Leslie B. Hammer (1990) Ph.D.
Profes sor Emerita of Ps ychology.Ph.D. 1991 Bowling Green State University.
Roger D. Jennings (1969) Ph.D.
Profes sor Emeritus of Psychology. Ph.D. 1963 University of Colorado.

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Profess or Emeritus of Ps ychology. Ph.D. 1973 Cornell University.
James A. Paulson (1970) Ph.D.
Profess or Emeritus of Ps ychology. Ph.D. 1973 Stanford University.

Cord B. Sengstake (1964) Ph.D.
Profess or Emeritus of Ps ychology. Ph.D. 1963 University of Oregon.
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Ronald E. Smith (1955) Ph.D.
Profess or Emeritus of Ps ychology. Ph.D. 1954 Univers ity of Utah.
Donald Truxillo (1994) Ph.D.
Profess or Emeritus of Ps ychology. Ph.D. 1987 Louisiana State University.

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## Department of Sociology

Faculty
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Senior Instructor I. Ph.D. 2013 Portland State University.
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Associate Dean, Professor of Sociology.Ph.D. 1996
University of Texas.
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Profess or of Sociology. Ph.D. 1995 University of Wisconsin.

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Senior Instructor II. M.S. 1999 Portland State University.
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Profess or of Sociology.Ph.D. 2010 University of Connecticut.

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Associate Professor of Sociology. Ph.D. 2011 Northeastem University.
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Associate Professor of Sociology. Ph.D. 1998 University of Wisconsin.

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Associate Professor of Sociology. Ph.D. 2013 University of California, Irvine.
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Associate Professor of Sociology. Ph.D. 2010 Stanford University.

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Profes sor of Sociology. Ph.D. 1974 Univers ity of California at Irvine.

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Profes sor of Sociology. Ph.D. 2003 University of Minnesota.

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Associate Professor of University Studies and Sociology. Ph.D. 2008 University of Texas, Austin.

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Emeriti Faculty
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Profes s or Emerita of Sociology. Ph.D. 1985 Indiana University.
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Profes sor Emerita of Sociology.Ph.D. 1973 Michigan State University.
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Profes sor Emeritus of Sociology. Ph.D. 1974 University of Washington.
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Ph.D. 1980 University of Pittsburgh.
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Associate Professor of Speech and Hearing Sciences.
Ph.D. 2005 University of W ashington.
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Chair and Professor of Speech and Hearing Sciences. Ph.D. 2001 University of Texas at Austin.
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Clinical Profess or of Speech and Hearing Sciences. M.A. 2000 University of Pittsburgh.
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Clinical Profess or of Speech and Hearing Sciences. M.S. 2002 Portland State University.
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As sociate Professor of Speech and Hearing Sciences.
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Clinical Profess or of Speech and Hearing Sciences. M.A. 1995 California State University, Chico.

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Profes sor of Physics. Ph.D. 1976 University of Texas; Ph.D. 1979 Oregon Graduate Center.
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Associate Professor of Electrical and Computer
Engineering. Ph.D. 1999 Stanford University.
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Profes sor of Computer Science. Ph.D. 1990 University of Michigan.

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Profess or of Electrical and Computer Engineering. Ph.D.
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Field Researcher, Purdue Pharma L.P.Ph.D. 2007 Portland State University.
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Director, Care Data Analysis, Kaiser Permanente. Ph.D.
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Senior Investigator, Kaiser Permanente, Center for Health Research. Ph.D. 1986 Ohio State University.
Danil Prokhorov (2004)Ph.D.
Computational Intelligence Manager, Toyota. Ph.D. 1997
Texas Tech.
Patrick Roberts (2005) Ph.D.
Biomedical Engineering, OHSU; Computational
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University of Gothenberg.
Thaddeus T. Shannon, III (2007) Ph.D.
Assistant Professor of Lighting Design, Department of
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Emeriti Faculty
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Profess or Emeritus of Systems Science and Electrical Engineering. Ph.D. 1961 University of California, Berkeley.
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Profess or Emeritus of Systems Science. Ph.D. 1954
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Studies.PhD. 2018 University of California, Riverside.
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Pedagogical University, St. Petersburg (Rus sia).
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Senior Ins tructor II of Spanish. M.A. 2006 and M.A. 2015 Portland State University.

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Director Russian Flagship Center; Professor of Russian. Ph.D. 1992 University of California, Berkeley.
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Professor of Spanish. Ph.D. 2011 Georgetown University.
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Assistant Professor of Japanese. Ph.D. 2016 Ohio State University.
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Profess or of French. Ph.D. 2008 University of California, Davis.

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Associate Professor of American Sign Language. Ph.D. 1997 University of Manchester (U.K.). and Ph.D. 2004 University of Alberta (Canada).
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Profess or of French. Ph.D. 1992 Princeton University.
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Profess or of Arabic. Ph.D. 2008 University of Michigan.
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Profess or of Japanese. Ph.D. 2010 University of
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Profes or of French. Ph.D. 2001 Duke University.
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Assistant Professor of Hebrew.Ph.D. 2010 Univers ity of Oregon.
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Senior Instructor II of French. M.A. 2000 University of Wisconsin-Milwaukee.
Robert Sanders (2001) Ph.D.
Associate Professor of Spanish. Ph.D. 2001 University of Arizona.

Anousha Sedighi (2005) Ph.D.
Profes sor of Persian. Ph.D. 2005 Univers ity of Ottawa (Canada).
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As sociate Professor of Spanish and Portuguese. Ph.D. 1995 Vanderbilt University.
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Profes s or of Second Language Acquis ition. Ph.D. 1999
University of California, Berkeley.
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William B. Fischer(1978) Ph.D.
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Profess or Emerita of French. Doctorat-es-Lettres 1983 University of Paris VIII (France).
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Profess or Emerita of Russian. Ph.D. 1976 Stanford University.

Kathleen Godfrey (2000) Ed.D.
Assistant Professor Emerita of German. Ed.D. 2013
Portland State University.
Martha Hickey (1992) Ph.D.
ProfessorEmerita of Russian. Ph.D. 1985 Harvard University.
Galina Kogan (1996) M.A.
Emerita Senior Instructor II of Russian. M.A. 1972 Kiev
State Pedag ogical Ins titute of Foreign Languages
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Laurence R. Kominz (1983) Ph.D.
Profess or Emeritus of Japanese. Ph.D. 1985 Columbia University.
Timm Menke (1988) Ph.D.
Profess or Emeritus of German. Ph.D. 1983 University of Washington.

Laureen K. Nussbaum(1973) Ph.D.
Profess or Emerita of German. Ph.D. 1977 University of Washington.
Linda Parshall(1986) Ph.D.
Profess or Emerita of German. Ph.D. 1974 University of London.
Jonathan O.Pease(1986) Ph.D.
Profess or Emeritus of Chinese. Ph.D. 1986 University of Washington.

Earl L. Rees (1970) Ph.D.
Profess or Emeritus of Spanish. Ph.D. 1977 University of Southern California.

Dirgham H. Sbait (1985) Ph.D.
Professor Emeritus of Arabic/Semitic Languages,
Literatures, and Folklore. Ph.D. 1982 Univers ity of Washington.

Kazem Tehrani(1975) Ph.D.|
Associate Professor Emeritus of Persian. Ph.D. 1974
Columbia University.
Patricia J. Wetzel (1984) Ph.D.
ProfessorEmerita of Japanese. Ph.D. 1984 Cornell
University.
Rita Rose Vistica (1975) Ph.D.
Associate Professor Emerita of French. Ph.D. 1965
FordhamUniversity.

## OHSU-PSU School of Public Health

David Bangsberg (2016) M.D., M.P.H. Dean, School of Public Health. M.D. 1990 The Johns Hopkins University School of Medicine. M.P.H. 1996 University of California, Berkeley.
Karen Camp (2018), M.P.A.
Associate Dean forFinance \& Adminis tration. M.P.A .2020 Arkans as State University.

Richard Johnson, (2018), Ph.D.
Associate Dean for Academic Affairs, Professor of Public Health, Ph.D. 1985 Oregon Graduate Institute.

Marguerita Lightfoot, (2021), Ph.D.
Associate Dean for Research, PhD. 1997 University of California, Los Angeles.

Lynne Messer, (2012), Ph.D.
Assistant Dean for Graduate Academic Affairs, Associate Profes sor of Public Health, Ph.D. 2005 Univers ity of North Carolina, Chapel Hill, NC.

Dawn Richardson (2012), Dr.P.H.
Associate Dean for Social Justice, Associate Professor of Public Health, Dr.P.H. 2010 University of California, Berkeley.

Liana Winett (2000) Dr.P.H.
Associate Dean forStudent Affairs and Community Eng agement, Associate Professor of Public Health. Dr.P.H. 1997 University of California, Berkeley.

Belinda Zeidler(1985) M.S.T.
Assistant Dean for Undergraduate Academic Affairs, Undergraduate Public Health Studies Academic Advisor, Undergraduate Internship Coordinator, Assistant Professor of Public Health. M.S.T. 1996 Portland State University.

## PSU Faculty

The faculty listed here are the PSU-employed faculty of the OHSU-PSU Schoolof Public Health. The OHSUemployed faculty of the OHSU-PSU School of Public Health can be located on the OHSU-PSU School of Public Health website.

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Senior Instructor II, MPH. 2009 Portland State University
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Instructor, D.V.M. 2001 Tufts University
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Profess or of Public Health, Dr.Ph.,1989 Loma Linda University

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Associate Professor of Public Health. Sc.D. 2006 Harvard University.

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Assistant Professor of Public Health, Ph.D. 2008 Portland State University

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Associate Professor of Public Health. Ph.D. 2004
University of North Carolina, Chapel Hill.
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Profess or of Public Health. Dr.P.H. 1990 University of Michigan.

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Associate Professor of Public Health. Ph.D. 2010 Oregon State University.

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Associate Professor of Public Health. Dr.P.H. 1997
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Bradley Wipfli (2016) Ph.D.
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Ass istant Professor of Public Health, Undergraduate Public
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## COURSES

## Course numbering system.

Courses are numbered as follows:
0-99 Noncredit courses or credit courses of a remedial, terminal, or semiprofes sional nature not applicable toward degree requirements.
100-299 Courses on the lower-division level.
300-499 Courses on the upper-division level.
$4 \mathrm{xx} / 5 \mathrm{xx} \quad$ Master's level graduate courses which are also offered as courses for undergraduates.
5xx Graduate courses offered in support of master's degree level instructional programs. Ordinarily employed for units whose majors have access to master's programs or for courses populated by master's students.
$5 x \mathrm{x} / 6 \mathrm{xx} \quad$ Graduate courses offered in support of doctoral degree level instructional programs which are also offered as courses for master's level students.

6xx Graduate courses offered in support of doctoral degree level instructional programs. Ordinarily employed for units whose majors have access to doctorate programs or for courses populated by doctorate students.

7xx Postbaccalaureate courses which may not be applied toward an academic degree.
8xx In-service courses with limited application toward advanced degrees and no application toward undergraduate degrees.
In addition, the following number systemis generally in effect in all Oregon public institutions: 100 to 110 and 200 to 210 courses are survey or foundation courses in the liberal arts and sciences in the disciplines covered.

The following numbered courses are repeating courses (they may be taken for more than one termunder the same number), with credit being granted according to the amount of work done:

- 199, 299, 399, Special Studies;
- 401, 501, 601, 801, Research;
- 402, 502, 602, 802, Independent Study;
- 403 Thes is/Honors Thesis; 503 Thes is/603 Dissertation;
- 404, 504, 604, 804, Cooperative Education/Internship;
- 405, 505, 605, 805, Reading and Conference;
- 406, 506, 606, 806, Problems/Projects;
- 407, 507, 607, 807, Seminar;
- 408, 508, 608, 808, Workshop;
- 409, 509, 609, 809, Practicum;
- 410, 510, 610, 810, Selected Topics.

Other repeating numbers are as signed to activity courses, such as art, music, and physical education.

Certain senior level courses are taught concurrently with their graduate-levelcounterparts. Hence this course may be offered for either graduate or undergraduate credit. (See quarterly Schedule of Classes for specific offering.) In the graduate credit course, additional work appropriate to the graduate level of study will be assigned.

## Actg - Accounting

## Actg 199 -Special Studies (1-3)

(Credit to be arranged.) Often offered as Debits and Credits, recommended for accounting majors.

## Actg 281 -Accounting Mechanics: Debits and Credit (1)

Focus on the mechanics of the accounting cycle using an interactive, online, problem-oriented learning system. Specific topics include use of T-accounts, rules of Debits/Credits, journal entries, adjusting and closing entries, and subsequent preparation of financial statements.
Prerequisite: BA 211.

## Actg 310 -Professional Accounting Seminar (2)

This course is designed to introduces tudents to a wide range of accounting careers. Guestspeakers frompublic accounting firms, private industry and governmental agencies will provide information and discuss various careerpaths within their organizations. Students will be required to develop a business portfolio that includes a professional career plan, resume and cover letter that will lead themto successful careers. In addition, students will also learn to cultivate the communication and soft skills demanded in a competitive market
Prerequisite: Borbetter in both BA 211 or consentof instructor.

## Actg 335 -Accounting Information Systems and Analytic Fundamentals (4)

Methodology used in information systems to: 1) collect, store, and extract accounting data; and 2 ) analyze, visualize, and communicate accounting information. Development of the accounting techniques used in the
handling of large amounts of information, special journals and controlling accounts, computerized processing of data, and computerized tools for analysis and visualization. Discussion of the challenges to effective accounting information systemdesign in a variety of organizational settings

Prerequisite: BA 213, BA 325, Ec 202, Stat 241 or Stat 243.

## Actg 360-Management Accounting (2)

Emphas is on the development, analysis, and communication of cost information relevant to the following functions: planning, decision making, cost control and management, pricing, and performance evaluation.

Prerequisite: BA 213, Ec 202, Stat 241 or Stat 243.

## Actg 381 - Financial Accounting and Reporting I (4)

Comprehensive study of the principles, conventions and postulates of financialaccounting. Appropriate preparation of GAAP financial statements and financial disclosures, including exposure to the judgment inherent in financial reporting. Considers information requirements and expectations of users of financial statements. International financial accounting standards will be considered where appropriate. Specific focus on the res ponsibility of accountants formaintaining professional accountability to the public interest in the face of institutional pres sures. This is the first course in a sequence of three: Actg 381, Actg 382, and Actg 383 which must be taken in sequence.
Prerequisite: BA 213, Ec 202, Stat 241 or Stat 243.
Actg 382 - Financial Accounting and Reporting II (4)
Comprehensive study of the principles, conventions and postulates of financial accounting. Appropriate preparation of GAAP financial statements and financial disclosures, including exposure to the judgment inherent in financial reporting. Considers information requirements and expectations of users of financial statements. International financial accounting standards will be considered where appropriate. Specific focus on the res ponsibility of accountants formaintaining professional accountability to the public interest in the face of institutional pres sures. This is the second course in a sequence of three: $\operatorname{Actg} 381$, $\operatorname{Actg} 382$, and $\operatorname{Actg} 383$ which must be taken in sequence.

Prerequisite: Actg 381.

## Actg 383 - Financial Accounting and Reporting III (4)

Comprehensive study of the principles, conventions and postulates of financial accounting. Appropriate preparation of GAAP financial statements and financial disclosures, including exposure to the judgment inherent in financial reporting. Considers information requirements
and expectations of users of financial statements. International financial accounting standards will be cons idered where appropriate. Specific focus on the responsibility of accountants for maintaining professional accountability to the public interest in the face of institutional pressures. This is the third course in a sequence of three: $\operatorname{Actg} 381, \operatorname{Actg} 382$, and $\operatorname{Actg} 383$ which must be taken in sequence.
Prerequisite: Actg 382.

## Actg 399 -Special Studies (1-6)

(Credit to be arranged.)

## Actg 401 - Research (1-6)

(Credit to be arranged.)

## Actg 404 - Internship (1-6)

(Credit to be arranged.)

## Actg 405 - Reading and Conference (1-6)

(Credit to be arranged.) Consent of instructor.

## Actg 406 -Special Projects (1-12)

Credit to be arranged.

## Actg 407 -Seminar (1-6)

(Credit to be arranged.) Student-selected problems in businessoperation and business management to be studied by the individual and discussed in group meeting under direction of academic staff.

## Actg 409 - Practicum(1-8)

(Credit to be arranged.)

## Actg 410 -Selected Topics (1-6)

(Credit to be arranged.)

## Actg 421 - Taxation (4)

Provides students with a broad range of tax concepts, tax policies, and different types of taxpayers. Students should develop an understanding of how taxlaws affect most businessand personal financial decisions. Taxreporting,
tax planning, and basic tax research skills will be emphasized.

Prerequisite: Actg 381.

## Actg 422 - Advanced Taxation (4)

Expands students' knowledge of how tax laws affect sole proprietors, partnerships, corporations, and other business entities. In addition, the tax laws applicable to estates, gifts, trusts, taxexempt organizations, and foreign persons are explored.
Also offered for graduate-level credit as Actg 522 and Actg 522 S and may be taken only once forcredit.
Prerequisite: Actg 421.

## Actg 430-Governmental Accounting (2)

An introduction to state and local governmental and "fund" accounting. Topics will include both the mechanics of fund accounting and presentation of financial statements by governmentalentities in a Comprehensive Annual Financial Report (CAFR).

Prerequisite: Actg 382.

## Actg 431 - Not-For-Profit Accounting (2)

Introduction to Not-for-Profit entities, how their legal and operational environments are different frombusinesses, and how accounting and fin ancial reporting standards differ as a result.
Prerequisite: Actg 382.

## Actg 445 - Forensic Accounting (4)

Introduces forensic and investigative accounting. Develops working knowledge of the fraud environment, fraud schemes, fraud prevention and detection controls, fraudster characteristics, interview and evidence techniques, the legal systemand process for litigation and mediation, how to testify in various trials, and how to conduct and write up a fraud investigation.
Also offered for graduate-level credit as Actg 545 and Actg 545S and may be taken only once for credit. .
Prerequisite: Actg 381.

## Actg 460 - Advanced Managerial Accounting (4)

Advanced development, analysis, and communication of cost information, focusing on the use of financial and nonfinancial information in decision making and strategic management. Cases and/or simulations will be used extensively.
Prerequisite: Actg 360.

## Actg 485 - Business Law (4)

Laws of contracts, negotiable checks, notes, and drafts, insurance, documents of title, sales of goods, letters of credit, employees and independent contractors, agency,
partnership, corporations, securities, bankruptcy, security interests, mortgages, suretyship and bulk sales. Covers law part of CPA exam.
Also offered for graduate-level credit as Actg 585 and Actg 585S and may be taken only oncefor credit. Prerequisite: BA 213, Ec 202, Stat 241 or Stat 243.

## Actg 490 - Advanced Financial Accounting (2)

Emphasizes accounting for business combinations, stock ownership investments and financial consolidations.
Prerequisite: Actg 382.
Actg 492 - Auditing Concepts and Practices (4)
Auditing standards and procedures observed by Certified Public Accountants in the examination of the financial statements of business and other organizations. Audit standards and objectives and conceptual framework for collection of evidence and assessment of control risk. Shortformaudit report and operational auditing.
Also offered for graduate-level credit as Actg 592 and Actg 592s and may be taken only once for credit. . Prerequisite: Actg 335 and Actg 382.

## Actg 493 - Advanced Auditing (4)

Audit objectives and procedures for the collection of evidence and the assessment of control risk are explored. The effects of attribute and variables sampling as well as the effects of computers and computer-control procedures on the audit process are examined. In addition, audit, compilation, and review reports are importantelements of this course.
Also offered for graduate-level credit as Actg 593 and Actg 593S and may be taken only once for credit. . Prerequisite: Actg 492.

## Actg 495 - Integrated Accounting Issues (4)

Integrates topics fromvarious accounting areas. Provides students with opportunities to see the accounting interactions and tradeoffs that res ult fromrealistic business situations. Course will enhance students' understanding of accounting and its influence on business, as well as the understanding of how business processes affect accounting results, through a set of comprehensive case studies.

Prerequisite: Actg 360, Actg 421, and Actg 492.
Actg 501 - Research (1-9)
(Credit to be arranged.)

## Actg 502 -Independent Study (1-4)

(Credit to be determined.)

## Actg 503 - Thesis (1-9)

(Credit to be arranged.)

## Actg 504 - Internship (1-9)

(Credit to be arranged.)

## Actg 505 - Reading and Conference (1-6)

(Credit to be arranged.) Consent of instructor.

## Actg 507-Seminar (1-6)

(Credit to be arranged.) Student-selected problems in businessoperation and business management to be studied by the individual and discussed in group meeting under direction of academic staff.

## Actg 507S -Seminar (1-8)

(Credit to be arranged.) Student-selected problems in businessoperation and business management to be studied by the individual and discussed in group meeting under direction of academic staff.

## Actg 509-Practicum (1-9)

(Credit to be arranged.)

## Actg 510 - SelectedTopics (1-6)

(Credit to be arranged.)

## Actg 511 - Financial Reporting (4)

An introduction to the reporting systemused by businesses to convey financial information to parties external to the enterprise. Primary emphasis is placed on understanding the financial reports that are the end product of this system-what they do and do not tell the user abouta bus inessenterprise. The accounting principles, conventions, and concepts underly ing fin ancial reporting are examined with the objective of developing the ability to read, comprehend, and performa basic analysis of financial statements. An introduction to environment performance reporting also will be provided. Ethics are essential in accounting and provide guidance on all aspects of financial reporting topics covered in this course.

## Actg 513 - Managerial Accounting and Control (4)

The coursecovers managerial accounting and control is sues, and focuses on the identification and use of accounting information as well as other information from within the organization.
Prerequisite: Actg 511.

## Actg 522 - Advanced Taxation (4)

Expands students' knowled ge of how tax laws affect sole proprietors, partnerships, corporations, and other business entities. In addition, the taxlaws applicable to estates, gifts, trusts, taxexempt organizations, and foreign persons are explored.
Also offered for undergraduate-level credit as Actg 422 and may be taken only once for credit. Prerequisite: Actg 421. Cross-Listed as: This is the same course as Actg 522S and may be taken only once forcredit.

## Actg 522S - Advanced Taxation (4)

Expands students' knowled ge of how tax laws affect sole proprietors, partnerships, corporations, and other bu siness entities. In addition, the taxlaws applicable to estates, gifts, trusts, taxexempt organizations, and foreign persons are explored.
Also offered for undergraduate-level credit as Actg 422 and may be taken only once for credit. Prerequis ite: Actg 421. Cross-Listed as: This is the same course as Actg 522 and may be taken only once for credit.

## Actg 525 - Tax Research Documentation and Procedure

 (4)Methods of researching tax rulings and laws in tax accounting; study of the adminis tration and responsibilities of tax practice.

## Actg 526 - Accounting Methods and Periods (4)

Deals with federal income tax issues that arise with respect to the determination of the proper periods for reporting income and deductions, overall methods of taxaccounting and all of the choices and options available to taxpayers.

## Actg 527 - Corporate Taxation I (4)

Introduction to the tax laws relating to corporations and their owners. The purpose of the course is develop an understanding of the federal income taxrules of the United States as they apply to the formation, operation, distribution, and liquidation of corporations.

Prerequisite: Actg 525, Actg 526, Actg 530.

## Actg 528 - Corporate Taxation II (4)

Continuation of Corporate Taxation I with emphasis on corporate reorganizations, operation, liquidation of subsidiary corporations and corporate division, and carryover of taxattributes.
Prerequisite: Actg 527.
Actg 530 - Taxation of Property Transactions (2)
Students are provided with the federal income tax consequences resulting froms ales, exchanges, and other dis positions of property, determining the taxable event; ascertaining basis and amountrealized; depreciation deductions; ascertaining gain or loss; limitations regarding the use of losses, including the at-risk and passive activity loss provisions.

## Actg 531 - PartnershipTaxation (4)

Tax treatment of partnership income; problems associated with the formation, operation, and dissolution of partnerships. Sale, withdrawal, retirement of partners; basic adjustments, unrealized receivables, and substantially appreciated inventory; Subchapter S Corporation compared to partnerships.

## Prerequisite: Actg 525.

## Actg 532-S Corporations Taxation (2)

Examination of tax treatment, tax problems, and tax planning techniques involving $S$ corporations; eligibility rules; election, revocation, and termination; treatment of income, deductions, and credits; determining the shareholder's taxable income; pass-through of corporate net operating loss; distributions of previously taxed income; and special taxes applicable to $S$ corporations.

Prerequisite: Actg 527 and Actg 531.

## Actg 533 - Financial Accounting for Income Taxes (4)

Students are exposed to the federal income tax consequences resulting fromsales, exchanges, and other dis positions of property, determining the taxable event; ascertaining basis and amountrealized; depreciation deductions; ascertaining gain or loss; limitations regarding the use of losses, including the at-risk and passive activity loss provisions.
Prerequisite: Actg 528.

## Actg 535-State and Local Taxation (4)

Examination of issues and taxation other than federal income tax, including property taxprocesses, sales and use taxes, multistate transactions, manufacturers excise tax, and sumptuary and regulatory excise taxes.
Prerequisite: Actg 525.

## Actg 536 - International Taxation (4)

Introduction to U.S. taxation of U.S. firms, citizens, and residents with foreign source income, and U.S. taxation of foreign firms and individuals doing business within the United States.

Prerequisite: Actg 527.

## Actg 537 - Tax Accounting Capstone Consulting Project (4)

This capstone course provides students with an opportunity to work on real business problems for companies. MTax students work as a 3-4 person consulting teamwith a client and Faculty Advisor to develop solutions that will be put to use by the client.
Prerequisite: Final termof program.

## Actg 539 - Trust, Estate \& Gift Taxation (4)

This course consists of a detailed review of the federal es tate tax, gift tax and generation-skipping tax laws. In the area of es tate taxation, as sets included, credits permitted and deductions allowed are reviewed in detail by reference to law, regulations and cases.

## Actg 540 - Practicum/ Internship (4)

The Accounting Practicumis an internship with an accounting firm or corporate finance group. This provides opportunities to apply programcontent to real-world environments, gain appreciation of work expectations and demands, and relate field experience to remaining taxation programcurriculum.
Prerequisite: Final termof program.

## Actg 542 - Tax Factors in Business Decisions (4)

Tax implications of common business questions and trans actions, including choices of business entity, acquisition and sale of business assets, compen sation and benefits planning, and U.S. taxation of international trade. Students will be exposed to the common income and estate tax planning strategies of individuals and families engaged in business.

Prerequis ite: Actg 512 or admis sion to the Master of Science in financial analys is program.

## Actg 544 -Professional Practices Seminar (1)

In this course you will further your leadership agenda through interactive discussion with regional leaders in the financial, taxation, and accountancy industries.

## Actg 545 -Forensic Accounting (4)

Introduces forensic and investigative accounting. Develops working knowledge of the fraudenvironment, fraud
schemes, fraud prevention and detection controls, fraudster characteristics, interview and evidence techniques, the legal system and process for litigation and mediation, how to testify in various trials, and how to conduct and write up a fraud investigation.
Also offered for undergraduate-level credit as Actg 445 and may be taken only once for credit. . Cross-Listed as: This is the same course as Actg 545S and may be taken only once for credit.

## Actg 545S - Forensic Accounting (4)

Introduces forensic and investigative accounting. Develops working knowledge of the fraud environment, fraud schemes, fraud prevention and detection controls, fraudster characteristics, interview and evidence techniques, the legal system and process for litigation and mediation, how to testify in various trials, and how to conduct and write up a fraud investigation.
Also offered for undergraduate-level credit as Actg 445 and may be taken only once for credit. . Cross -Listed as: This is the same course as Actg 545 and may be taken only once forcredit.

## Actg 550 - Advanced Financial Reporting (4)

Financial reporting for analysts. Studies how financial statements communicate the outcome of a company's operating, financing and investing transactions. Contemporary issues are examined in the context of factors that shape accounting standards and current trends in financial reporting.
Prerequisite: Admis sion to the Master of Science in Finance program.
Actg 551 - Accounting Information Systems (4)
Study of accounting information systems for operations with an emphasis on accounting issues. Addresses the information systems is sues encountered by internal financial analysts. Topics may include database and accounting information system design, model building, the use of accounting information for forecasting, and other topics associated with the development of information systems to support financial analysis.

## Actg 552 -Strategic Cost Management (4)

Course takes the perspective that managers should not use information from accounting systems designed to prepare external financialreports in order to make internal management decisions. Provides alternative approaches to developing and using accounting information. Special emphasis will be placed on understanding traditional cost systems, activity-based costing systems, and determining the cost of quality. Course will rely heavily on the examination of actual company situations.

Prerequisite: Actg 512 or admis sion to the Master of Science in financial analys is program.

## Actg 553 -Financial Statement Analysis (4)

Sound financial information for making business decisions is obtained by an unders tanding of accounting data from which the information is derived as well as by the application of tools of analysis. Students will gain an increased understanding of the properties and use of accounting numbers in the determination and forecasting of financial positions, results of operations, cash flows, the financial dis closure process, and its use in comparing businessperformance.
Prerequisite: Fin 551 or concurrent enrollment or Fin 561.

## Actg 560 -Professional Ethics and the Public Interest

 (2)Introduces students to ethical perspectives that provide the philosophical context for the study of applied business ethics. Students use practicalframeworks to address complex ethical and social is sues and explore org anizational processes and structures that can shape socialperformances. The context for this course is financial and accounting situations.

## Actg 565 - Current Topics in Global Financial Accounting (4)

Covers current complexfinancial accounting is sues faced by corporations operating within a global context. Because of today's rapidly changing financial accounting environment, this course will take an adaptable view of topics covered, monitoring recent regulatory is sues to include timely complex is sues that must be understood by today's financial accounting professional.

Prerequisite: admis sion to the MSFA program.

## Actg 585 -Business Law (4)

Laws of contracts, negotiable checks, notes, and drafts, insurance, documents of title, sales of goods, letters of credit, employees and independent contractors, agency, partnership, corporations, securities, bankruptcy, security interests, mortg ages, suretyship and bulk sales. Covers law part of CPA exam.

Also offered for undergraduate-level credit as Actg 485 and may be taken only once for credit. . Cross-Lis ted as: This is the same course as Actg 585S and may be taken only once for credit. .

## Actg 585S - Business Law (4)

Laws of contracts, negotiable checks, notes, and drafts, insurance, documents of title, sales of goods, letters of credit, employees and independent contractors, agency, partnership, corporations, securities, bankruptcy, security
interests, mortgages, suretyship and bulk s ales. Covers law part of CPA exam.

Also offered for undergraduate-levelcredit as Actg 485 and may be taken only once for credit. Prerequisite: Fin 226 or BA 385 (Fin 226 or BA 385 not required for students in postbaccalaureatecertificate in accounting program). Cross-Listed as:This is the same course as Actg 585 and may be taken only once for credit.

## Actg 592 - Auditing Concepts and Practices (4)

Auditing standards and procedures observed by Certified Public Accountants in the examination of the financial statements of business and other organizations. Audit standards and objectives and conceptual framework for collection of evidence and assessment of control risk. Shortformaudit report and operational auditing.

Also offered for undergraduate-level credit as Actg 492 and may be taken only once for credit. . Cross-Listed as: This is the same course as Actg 592S and may be taken only once for credit.

## Actg 592S - Auditing Concepts and Practices (4)

Auditing standards and procedures observed by Certified Public Accountants in the examination of the financial statements of business and other organizations. Audit standards and objectives and conceptual framework for collection of evidence and assessment of control risk. Shortformaudit report and operational auditing.
Also offered for undergraduate-level credit as Actg 492 and may be taken only once for credit. . Prerequisite: Actg 335 and 382. Cross-Listed as: This is the same course as Actg 592 and may be taken only once for credit.

## Actg 593 - Advanced Auditing (4)

Audit objectives and procedures for the collection of evidence and the assessment of control risk are explored. The effects of attribute and variables sampling as well as the effects of computers and computer-control procedures on the audit process are examined. In addition, audit, compilation, and review reports are importantelements of this course.
Also offered for undergraduate-levelcredit as Actg 493 and may be taken only once for credit. . Prerequisite: Actg 492. Cross-Listed as: This is the same course as Actg 593S and may be taken only once for credit. .

## Actg 593S - Advanced Auditing (4)

Audit objectives and procedures for the collection of evidence and the assessment of control risk are explored. The effects of attribute and variables sampling as well as the effects of computers and computer-control procedures on the audit process are examined. In addition, audit, compilation, and review reports are importantelements of this course.

Also offered for undergraduate-level credit as Actg 493 and may be taken only once forcredit. . Prerequisite: Actg 492. Cross-Listed as: This is the same course as Actg 593 and may be taken only once forcredit.
Actg 601 - Research (1-9)
(Credit to be arranged.)

## Actg 607 -Seminar (1-9)

(Credit to be arranged.)

Age - Aging/Gerontology
Age 403 - Thesis (1-12)
(Credit to be arranged.)

## Age 501-Research (1-6)

(Credit to be arranged.) Consent of Instructor.

Age 502 - Independent Study (1-12)
(Credit to be arranged.)

## Age 504 - Cooperative Education/Internship (1-15)

(Credit to be arranged.)

## Age 505 - Reading and Conference (1-8)

(Credit to be arranged.)

## Age 510 -SelectedTopics (1-8)

(Credit to be arranged.)

## Age 516 - Families and Aging (4)

Family ties of middle aged and older adults are explored using a life course perspective. The diversity of family structure and experience is emphasized with attention to gender, race, class, and ethnicity. Life transitions are highlighted as are informal and formal services available to support older adults and their families.

Prerequisite: junior standing.
Age 523 - Business and Aging (4)
Economic and business implications of population aging, including an exploration of demographic changes, the
economic reality faced by today's older adults in work and retirement, and older adults as consumers.

## Age 556 - Health Aspects of Aging (4)

Examination of health-related changes that occur with aging. Review of current scientific literature with an investigation of physiological mechanisms responsible for changes in functional capacity throughout life. Explores the role of physical activity and nutrition in he althy aging.

## Age 557 - National Long-term Care Policy (3)

This course examines the need for long-termcare services and the risk factors associated with utilization of themas well as familiarizing students with the financing and delivery mechanisms in long-termcare, both public and private. The policy is sues in current long-termcare initiatives are explored.
Also offered as Age 657 and may be taken only once for credit.

## Age 558 - Perspectives on Aging (3)

An introduction to the field of gerontology is presented from the pers pectives offered by multiple disciplines, including sociology, psychology, biology, economics, political science, and demography. Stereotypes of aging and theoretical frameworks for understanding aging are examined, as are normal age-related changes, the impact of social, political, and economic conditions on the process of aging, and the myriad consequences of a growing population of elders.
Also offered as Age 658 and may be taken only once for credit.

## Age 559 - Economics of Aging (3)

Objectives are (1) understand the roots of income inequality between the aged and non-aged; (2) review the economic and policy factors that influence thedecision to retire; (3) understand the political economy of old age income support in the U.S. and abroad; (4) explore the history, operation, and policy questions of our major public pension system, social security; and (5) discuss private pensions in relationship to U.S. income maintenance policy.
Also offered as Age 659 and may be taken only once for credit.

## Age 560 - Mental Health and Aging (3)

Focus on a psychological approach to mental health and aging. The physical and social environments of older people, as well as the individual's physical and psychological condition, strongly affect the mental health and quality of life of older people. It is the goal of the
course to be useful to people who work with older adults and their families, or to people who want to understand the changes that may be happening for older members of their own families. Guest speakers fromthe field of geriatric mental health will supplement the readings and course assignments.

Also offered as Age 660 and may be taken only oncefor credit.

## Age 562 - Global Aging (3)

The rapid, unprecedented aging of the world's populations is resulting in myriad changes that will affect societies, cultures, economies, families, and individuals and their daily lives. Students will learn about broad global trends related to the aging of the world as well as aging in particular countries and regions.

## Age 563 -Service Learning in Nicaragua: Enhancing Communities for an Aging Society (3)

Rapid aging in Nicaragua's population will cause changes affecting individuals, familiues, communities, culture and economies. Students will attend class at PSU and travel to Nicaragua to learn about living conditions and support structures in place for older Nicaraguans and participate in service-learning projects to improve the lives of Nicaraguan elders.
Prerequisite: Age 562.

## Age 657 - National Long-term Care Policy (3)

This course examines the need for long-termcare services and the risk factors associated with utilization of themas well as familiarizing students with the financing and delivery mechanisms in long-termcare, both public and private. The policy is sues in current long-termcare initiatives are explored.
Also offered as Age 657 and may be taken only oncefor credit.

## Age 658 - Perspectives on Aging (3)

An introduction to the field of gerontology is presented from the perspectives offered by multiple disciplines, including sociology, psychology, biology, economics, political science, and demography. Stereotypes of aging and theoretical frameworks for understanding aging are examined, as are normal age-related changes, the impact of social, political, and economic conditions on the process of aging, and the myriad consequences of a growing population of elders.
Also offered as Age 558 and may be taken only oncefor credit.

## Age 659 - Economics of Aging (3)

Objectives are (1) understand the roots of income inequality between the aged and non-aged; (2) review the economic and policy factors that influence the decision to retire; (3) understand the political economy of old age income support in the U.S. and abroad; (4) explore the history, operation, and policy questions of our major public pension system, social security; and (5) discuss private pensions in relationship to U.S. income maintenance policy.
Also offered as Age 559 and may be taken only once for credit.

## Age 660 - Mental Health and Aging (3)

Focus on a psychological approach to mental health and aging. The physical and social en vironments of older people, as well as the individual's physical and psychological condition, strongly affect the mental health and quality of life of older people. It is the goal of the course to be usefulto people who work with older adults and their families, or to people who want to understand the changes that may be happening for older members of their own families. Guest speakers fromthe field of geriatric mentalhealth will supplement the readings and course as signments.
Also offered as Age 560 and may be taken only once for credit.

## Anth - Anthropology

Anth 101 - Introduction to Biological Anthropology (4)
The biological side of anthropology: human biology, primatology, and paleoanthropology. Micro- and macro evolution and their contribution to modern human variation; adaptation and evolutionary relationships among humans, primates, and our fossil ancestors; the fallacy of the race concept. Bio-cultural evolution among humans.

## Anth 102 - Introduction to Archaeology (4)

The study of ancient cultures of the world. Introduction to the theories and techniques of archaeological investigation.

## Anth 103 - Introduction to Social/Cultural Anthropology (4)

Study of modern and recent societies in cross cultural perspective. Focus on methods for understanding social and cultural differences and similarities.

Anth 299-Special Studies (1-6)
(Credit to be arranged.)

## Anth 300U- The Modern Worldin Anthropological Perspective (4)

Examination of anthropological approaches to cultural diversity in a global context. Includecultural contact between the Fourth World and the industrialized world; health, nutrition, and poverty in different world areas; ecocide andethnocide; political movements in the Fourth World; racism; and sexism.

## Anth 301 - The Politics of Ethnographic Writing (4)

How do anthropologists write about 'the other'? Critical reading of ethnographic writing explores the power dynamics at play in research methodology and anthropological writing. Topics may include, but will not be limited to, decolonizing anthropology, the politics of ethnographic representation, identity formation, gender, sexuality, race, political economy, and transnational culture flows.

## Anth 304 - Identity and Society (4)

Examines powerrelations in social organization from the family to the global economy. Topics include political processes, exploitation, identity, agency, social change, and globalization, with an emphasis on understanding contemporary social is sues in cross-cultural pers pective through critical, feminist, interpretative and political economic theoretical frameworks. Designed for anthropology majors and minors. Expected preparation: Anth 103.

## Anth 305-Culture and Power (4)

Explores the historical development of the concept of culture within anthropology. Examines how the culture concept and the theories based on it both challenge and reproduce existing power relations. Topics include: structural racism, violence and policing, globalization, inequality, religion, technology. Designed for anthropology majors and minors. Note: This course is not approved for dis tribution credits. Expected preparation: Anth 103.

## Anth 310U - Chinese Culture and Society (4)

Recent is sues in contemporary Chinese culture and society including rural and urban transformations, minority representations, gender shifts, religious and res istance movements and other trends. Most years will focus on PRC but may also include Hong Kong and Taiwan.

## Anth 311U- Peoples and Cultures of Latin America (4)

Introduction to the peoples and cultures of Latin America, including Mexico, Central and South America, and the Caribbean. Course topics include religion, ecology, race and ethnicity, gender, urbanization, conflict, and social change.

## Anth 312U- Southeast Asian Societies and Cultures (4)

Introduction to the societies and cultures of Southeast Asia, the area encompassed today by the nations of Burma (Myanmar), Thailand, Laos, Cambodia, Vietnam, Malaysia, Singapore, Brunei, Indonesia, and the Philippines. Course topics explore the religious and cultural diversity of the area, as well as historical and cultural themes that traverse this region.

## Anth 313U- Native American-Settler Relations (4)

Consideration of the contacts, entanglements, exchanges and frictions between Native Americans and colonialist settler populations, including is sues of decolonization, social and cultural change and persis tence, and shifting governmental policies.

## Anth 314U- Native Americans (4)

Ethnographic survey of past and present North American Indigenous peoples, covering sense of place, negotiations and adjus tments to colonialism, his torical trajectories, and contemporary ways of life.

## Anth 315U - American Culture (4)

Centralbeliefs and core values of modern American society are examined froman anthropological perspective. Considers: value of constructs such as individualismand conformity; creation of public images; kinship and friendship; privacy; schools and neighborhoods; and conflicts in volving ethnicity, social class, and gender. Questions the role of culture in ourown lives, thereby gaining a greater understanding of social experience and of the concept of culture.

## Anth 317U- South Asia (4)

Introduction to the ethnography of South Asia, the area encompassed by India, Pakistan, Sri Lanka, Nepal, Bangladesh, Butan and the Maldive Islands. Topics include colonial history; class, caste, and gender hierarchies; cultural and linguistic diversity; religious conflict; and social change.

Anth 318U - Asian American Experience (4)
Explores the contemporary experiences of Asian immigrants to the United States, focusing on is sues of migration, family adjustments, community formations, and identity constructions among diverse groups of A sians including Chinese, Japanese, Korean, Filipino, Vietnamese, South Asians, and others.

## Anth 319U-Traditional Cultures of Africa (4)

A survey of the culture history and characteris tics of the traditional (before Western influence) cultures of African peoples. This is the same course as BSt 319U and may be taken only once for credit.
Cross-Listed as: BSt 319U.

## Anth 320 - Indigenous Peoples of the Pacific Northwest Coast (4)

Indigenous peoples of the Pacific North west coast of North America include some of the most affluent, diverse, and complex peoples in the world. This course examines the unity and diversity of thesecultures fromAlaska to the Oregon-California border by tracing their his torical evolution and responses to contemporary problems. Topics include: subsistenceeconomies and resource tenure, social and political identity, art, ceremonial and spiritual life, culture change, persistence, and revitalization, and modern Indigenous-state relations.

## Anth 325U- Culture, Health, and Healing (4)

Introduction to the field of medical anthropology. Biocultural as pects of disease and healing. Comparis on of healers and healing professions in Western and nonWestern societies. Interactions among culture, social relations, environment, and health. Topics include healers and healing roles, ethnomedicine and medical pluralism, clinical medical anthropology, and nutritional anthropology.

## Anth 330U - Anthropology of Folklore (4)

Review of folklore, including legend, folktales, music, and dance, and its role in society. Emphas is will be on the study of folklore by anthropologists in both western and non-western contexts. Explores how folklore can reveal social relations, conflict and resistance, social change and gender relations.

## Anth 333U - Anthropology of Food (4)

Explores biological and cultural as pects of past and present human food systems. Topics include nutrition, the cultural significance of food, domestication of plants and animals,
archaeological records of competitive feasting, global movement of foods during the colonial period, new revolutions in food technology, the politics and economics of contemporary food systems, and eating disorders such as obesity, anorexia, and bulimia.

## Anth 335 - Anthropology of Space and Place (4)

Space and place are foundational to human cognition, emotion, and expericen, and yet we often take themfor granted. This course examines the origins, development and contemporary variation of human senses of space, place, and environment in a variety of cultural settings around the world.

## Anth 340U- Design, Politics andSociety (4)

Anthropological approaches to design aesthetics, politics, expertise and innovation. Focuses onhow design is located in forms of power, inequality and exclusion. Addresses how "anthropological ways of knowing" and ethnographic research methods can benefit design practice. Critically explores the fields of design thinking and humanitarian design as well as efforts to use design for social justice.

## Anth 345 - Practicing Anthropology (4)

Introduction to applied anthropology as a tool to address real world problems related to development, en vironment, human health, cultural res ource management, conflict, and more. Includes creation of a pers onalized career plan which will ass ist in the transition fromeducation to profession following the completion of an undergraduate degree in anthropology.

## Anth 350 - Archaeological Method and Theory (4)

A survey of current techniques, and theories applied in the discovery and analysis of archaeological materials. Learn and practice archaeological research design, interdisciplinary skills, field survey, excavation, dating, and other analytical techniques. Four hours of lecture and 1 hour lab (co-requisite Anth 350L) each week. Expected preparation: Anth 102.
Corequisite: Anth 350L.

## Anth 350L - Archaeological Methodand Theory Laboratory (1)

Lab for Anth 350.
Corequisite: Anth 350.

## Anth 355U-Colonial and Postcolonial Historical Archaeology (4)

Survey of the materials, methods, and theories of historical archaeology in the western United States focussing on colonialismand postcolonialis $m$. Includes laboratories in artifact analy sis and interpretation. Topics include the archaeology of forts and the furtrade, American immigration, heritage, and public interpretation.

## Anth 357U- Archaeology in Popular Culture (4)

Build knowledge of science in archaeology through analys is of archaeological representations in popular culture (e.g.films, television, video games, fiction). Study relationships between archaeology, archaeology in popular culture, and modern society.

## Anth 361U- The Archaeology of Europe (4)

An inves tigation of the archaeology of Europe, and major events in European prehistory including pre-modern and modern human interactions in Europe, the Upper Paleolithic technological revolution, the advent of farming, and the development of state-level societies.

## Anth 362U- African Prehistory (4)

Methods, sources of evidence, and theresults of the study of prehistoric cultures of Africa fromthe earliest traces until the first written records; it includes human origins (physical and cultural evolution), theearliest civilization, peopling of Africa, migrations, earliest settlements, origins of agriculture and metallurgy. This is the same course as BSt 362 U and may be taken only once for credit.

Cross-Listed as: BSt 362U.

## Anth 363U- Egyptian Archaeology: From Earliest Peoples to the Pyramid Age (4)

A survey of the archaeologicalrecord of Egyptbeginning with the earliest evidence of human occupation to the Pyramid era, with an emphas is on the period from6000 BCE to the end of the Old Kingdomperiod (ca 2000 BCE). Lectures and readings will focus on how archaeological materials are used to reconstruct events in Egypt's past.

## Anth 364U- The Archaeology of the Pacific Northwest

 (4)A thematic exploration of Indigenous societies in the Pacific Northwest of North America through time, starting from the earliest archaeologist evidenceover 16,000 years ago to the 19th and 20th centuries. Students are introduced to scientific approaches to reconstructing the past. Major
topics include: the shift to sedentism; the formation of structural inequalities; and the development of complex and varied approaches to organizing labor, political, and economic systems.

## Anth 365U- The Archaeology of North America (4)

An investigation of major events and cultural transitions in the ancient cultures and societies of North America north of Mexico, including major migrations, hunter-g atherer lifeways, the development of sedentism, and of farming, and the development of social complexity and inequality.

## Anth 366U- The Archaeology of Mesoamerica (4)

A survey of the ancient cultures of Mes oamerica emphasizing evidence of the earliest people, subsistence practices including plant domestication, and the development of social complexity. Phenomena such as pyramids and temples, mathematics, calendars and writing systems, combine to paint a rich picture of cultures in the Americas before European contact. Course material focuses on the Olmec, Maya and Highland Mexico.

## Anth 368U- The Archaeology of Oceania (4)

An inves tigation of the archaeology of Oceania, from the earliest peopling of New Guinea over 60,000 years ago to subsequent voyaging and human settlement throughout the blue continentof the Pacific Is lands. Explores cultural developments and human ecosystemengineering in is land groups such as Guamand the Mariana Is lands, Hawai'i, Rapa Nui/Easter Is land, and AotearoaNew Zealand.

## Anth 370 - Paleoanthropology (5)

Ape and human (i.e., hominoid) evolution fromthe Miocene through the Pleistocene with focus on the fossil record. Emphasis on methods used to reconstruct the past, including integration of knowledge fromgeology and paleoecology; functional and comparative anatomy; phylogenetics; and prehis toric archaeology. Lectures and one biweekly laboratory. Expected preparation: Anth 101.

Corequisite: Anth 370L.
Anth 370L - Paleoanthropology Laboratory (0)
Lab for Anth 370 Paleoanthropology.
Corequisite: Anth 370.

## Anth 372 - Human Variation (4)

Mechanisms producing biological variation at genetic and genomic levels in contemporary human populations. Significance of geographic patterns for reconstructing
prehistoric dispersals and settlement of the earth, beginning with our origins on the African continent. Integration of evolutionary genetics with biogeographic, environmental, fos sil, archaeological, and linguistic evidence bearing on human prehistory. Expected preparation: Anth 101.

## Anth 373 - Primate Ecology and Behavior (4)

Origins, diversity, ecology, behavior, and conservation of living non-human primates. Primate ecology and behavior are explored from a comparative and evolutionary perspective. Emphasis on primates in naturalhabitats ratherthan in captive settings, spanning lemurs, lorises, tarsiers, monkeys and apes. Expected preparation: Anth 101.

## Anth 376U- The Neandertals (4)

Neandertal biology and behavior; who they were, how they lived, and the nature of interactions between Neandertals and modern humans. Critical debates over the place of the Neandertals in human evolution. Exploration draws from paleontological, archaeological, and genetic data, with views into the history of scientific and popular thought about Neandertals.

## Anth 379U- Practicing ForensicScience (4)

Survey of topics in forensic science: DNA, drug chemistry, toxicology, firearms, and latent prints. Focus on forensic an thropology and taphonomy, including assessment of age, sex, population-based skeletal variation, and effects of peri-/post-mortemenvironmental processes on forensic investigation. Course clarifies popular media mis information with fact-based overview of real forensic analys is. Expected preparation: Anth 101.

## Anth 399 -Special Studies (1-12)

See department for course description. (Credit to be arranged.)

## Anth 401-Research (1-6)

See department for course description. Consent of instructor. (Credit to be arranged.)

## Anth 404-Cooperative Education/internship(1-12)

See department for course description. (Credit to be arranged.)

## Anth 405-Reading and Conference (1-6)

See department for course description. Consent of instructor. (Credit to be arranged.)

## Anth 407-Seminar (1-6)

See department for course description. Consent of instructor. (Credit to be arranged.)

## Anth 409-Practicum (1-9)

(Credit to be arranged.)

## Anth 410 -SelectedTopics (1-6)

See department for course description. Consent of instructor. (Credit to be arranged.)

## Anth 412 - Ethnographic Methods (4)

Practical coursework and community-based experience in research design and qualitative methodology. Students conceptualize and implement research projects, gather and analyze data, and write a proposal for hypothetical future research. Essential training forbasic ethnographic research and applied projects.
Also offered for graduate-level credit as Anth 512 and may be taken only once forcredit. Prerequisite: Upper division standing.

## Anth 414-Culture and Ecology (4)

A critical analys is of the interrelations of culture, social structure, and human ecology. Social organization as influenced by characteristic patterns of resource exploitation. The uses of natural environment fromthe viewpoint of the members of societies.

Also offered for graduate-level credit as Anth 514 and may be taken only once for credit. . Prerequisite: Upper division standing.

## Anth 415 - Applied Anthropology (4)

Examines theories, methods, and ethical considerations required to conduct applied anthropology in a variety of contexts. Students will carry out independent research on a real world problemlinked with his/hercareer goal.

Also offered for graduate-level credit as Anth 515 and may be taken only once forcredit. .Prerequisite: Anth 304 or Anth 305.

## Anth 416 - Urban Anthropology (4)

Global examination of urban phenomena including: spatial design of urban built environments, the production of
locality, urban political activism, ideas of cosmopolitanism, racial segregation, violence, migration, informal economies, subcultures, and new technologies that impact socialrelations in cities across the world.
Also offered for graduate-level credit as Anth 516 and may be taken only once for credit. . Prerequisite: Upper division standing.

## Anth 417 - Advanced Topics in Native American Studies (4)

In-depthexamination of a current scholarly topic in the anthropology of Native North America, especially in relation to colonialis mand Native res istance. Cours e will cover appropriate theory, as well as ethnographic and ethnohistorical materials.

Also offered for graduate-level credit as Anth 517. . Prerequisite: Upper division standing.

## Anth 418-Environmental Anthropology (4)

What can anthropology teachus about contemporary environmental problems? Emphasizing key is sues of environmentalchange, adaptation, conservation and sustainability, biocultural diversity, resilience, political ecology, and environmentaljustice, this course examines how the cross-cultural study of human-environmental relations can improve our understanding of contemporary environmental problems and their solutions.
Also offered for graduate-level credit as Anth 518 and may be taken only once for credit. . Prerequisite: Upper division standing.

## Anth 422 - Tribal Sovereignty and Policy (4)

An examination of current federal, state, and tribal law and policy pertaining to Indian affairs, including tribal government organization, government-to-government relations, economic development, natural and cultural resource management, health care, welfare, and education. Both reservation communities and the Portland metropolitan Indian community are considered. Student research is based on reading, field trips, and interviews with tribal officials and other policy professionals.
Also offered for graduate-level credit as Anth 522 and may be taken only once for credit. . Prerequisite: Upper division standing.

## Anth 425 - Topics in Medical Anthropology (4)

In-depth exploration of contemporary US and global health is sues through critical, interpretive, biocultural, and ecological perspectives. Rotating topics may includebut are not limited to pandemics and epidemics, emerging illnesses, food systems, new medical technologies, social meanings of the body and illness identities, patient activism, public health interventions, health-care policy, bioethics, and the medicalization of social problems. This course may be repeated once for credit.

Also offered for graduate-level credit as Anth 525 and may be taken only once forcredit. .Prerequisite: Upper division standing.

## Anth 426-Transnationalism and Migration (4)

In-depthexploration of globalization, transnationalism, and migration. Topics include colonialismand the history of world connections, the global economic sy stem, cultural imperialism, nationalismand identity, migration, refugees, touris m , and the commodification of local cultures.
Also offered for graduate-level credit as Anth 526 and may be taken only onceforcredit. .Prerequisite: Upper division standing.

## Anth 428 - Political Anthropology (4)

Survey of major anthropological approaches to politics, power, activismand social change, examined in light of historical and contemporary social tensions around the world. Emphasis on decolonization, politicaleconomy, and critical race and feminist theories.
Also offered for graduate-level credit as Anth 528 and may be taken only once forcredit. .Prerequisite: Upper division standing.

## Anth 430 -Myth, Ritual, and Symbol (4)

A critical examination of classic and recent anthropological theories in the cross-cultural study of symbolic forms.
Also offered for graduate-level credit as Anth 530 and may be taken only once forcredit. .Prerequisite: Upper division standing.

## Anth 431 - Topics in Latin American in Ethnography

 (4)In-depthexploration of a currenttopic in Latin American and Caribbean anthropology, especially in relation to power, structural inequality and violence, cultural identities, social movements, the State, and postcolonial histories. Course materials will cover both theory and ethnography.
Also offered for graduate-level credit as Anth 531.. Prerequisite: Upper Division Standing.

## Anth 432 - Gender, Sex, and Sexuality in Anthropological Perspective (4)

A theoretical introduction to gender, sex, and sexuality, including ethnographic examples fromaround the world. Explores biological and social as pects of sexand gender as they intersect with race, class, and nationality. Examines how gender relates to care work, kinship, and social reproduction. Considers transnational migration, surveillance, biopower, and political battles over reproductivetechnologies, gender-affirmative surgery, and sex work.

Also offered for graduate-level credit as Anth 532 and may be taken only once for credit. .Prerequisite: Upper division standing.

## Anth 435 - Visual Anthropology (4)

Examination of visual representation and visual research in Sociocultural Anthropology with a focus on photographic images, ethnographic films, and mass media.
Also offered for graduate-level credit as Anth 535 and may be taken only once for credit. . Prerequisite: Upper division standing.

## Anth 440 -Design Anthropology (4)

Explores the relationship between anthropology and design. Addresses how anthropologists collaborate with designers in industry to develop new products. Students apply ethnographic methods to do rapid design research and develop prototypes of products and services. The course is usefulfor students interested in human centered approaches to problemsolving and for students pursuing a career in designing innovative products or doing user experience research.
Also offered for graduate-level credit as Anth 540 and may be taken only once for credit. Prerequis ite: Upperdivision standing.
Anth 447-Advanced Topics in Asian Anthropology (4)
In-depthe exploration of a current topic in Asian anthropology, especially in relation to social change, nationalis mand conflict, colonialism, or modernization. Course materials will cover both theory and ethnography.
Also offered for graduate-le vel credit as Anth 547.. Prerequisite: Upper division standing.

## Anth 451 - History of Archaeology (4)

A chronological survey of developments in the field of archaeological inquiry: major schools of thoughts, innovations in method and theory, key personalities and their contributions.
Also offered for graduate-level credit as Anth 551 and may be taken only once for credit. . Prerequisite: Anth 350 .

## Anth 452 - Archaeological Lab Methods (4)

Learn and practice archaeological lab methods and techniques through analysis of common materials (e.g. lithics, ceramics) recovered from archaeological sites.
Also offered for graduate-level credit as Anth 552 and may be taken only once for credit. . Prerequisite: Upper division standing.

## Anth 453 - Archaeological FieldMethods (4)

Learn the theory, methods, and practice of archaeological field work. Topics include research design, survey and
reconnaissance, siteexcavation, sampling and recording techniques, mapping, and cultural res ource management.

Also offered for graduate-level credit as Anth 553 and may be taken only onceforcredit. .Prerequisite: Upper division standing.

## Anth 454 - Archaeological FieldSchool (6)

Engage in the scientific survey, mapping, and excavation of archaeological sites during a summer field project. Students will also gain training and experience in public engagement. Approximately 40 hours of field work per week, with a week of laboratory work.

Also offered for graduate-level credit as Anth 554 and may be taken only once for credit. .Prerequisite: Admis sion to course is by permis sion of instructor via an application process.

## Anth 455 - Analysis of Faunal Remains (5)

Reviews is sues of recovery, identification, quantification, and interpretation of archaeological faunal remains . Seminar component in volves discussion and critical review of recent faunal studies. Laboratory component introduces student to skeletal anatomy of vertebrates (with focus on fishes and mammals ) and basic procedures used in faunal analys is.

Also offered for graduate-level credit as Anth 555 and may be taken only once forcredit. .Prerequisite: Anth 350.

## Anth 456 - Cultural and Heritage Resources Management (4)

Introduction to the preservation, conservation, and management of cultural and heritage res ources in North America, including the legal and regulatory frameworks. Topics include agency and private-sector archaeology, laws affecting antiquities trafficking, consultation with American Indian tribes and other stakeholders, traditional cultural properties, and landscape.
Also offered for graduate-level credit as Anth 556 and may be taken only onceforcredit. Prerequisite: Upper division standing.

## Anth 457 - The Archaeology of Hunter-Gatherers (4)

An investigation of the economic and social diversity among modern and ancient hunter-gatherers and the theories and methods used by archaeologists to investigate and explain that diversity. Examines topics such as the evolution of hunting and gathering, hunter-gatherer settlement and mobility strategies, social complexity among hunter-gatherers and hunter-gatherers in the modem world.
Also offered for graduate-level credit as Anth 557 and may be taken only once for credit. .Prerequisite: Upper division standing.

## Anth 458 - The Archaeology of Disaster (4)

Examine archaeological approaches to studying human responses to past disasters, both natural and human-made, and the application of archaeology to contemporary dis as ter preparedness and related is sues. Topics include past human-environment interactions, climate change, vulnerability, risk, and resilience.

Also offered for graduate-level credit as Anth 558 and may be taken only once for credit. . Prerequisite: Upper division standing.

## Anth 460 - Public and Community Archaeology (4)

Reviews ways archaeology contributes to the modern world as a science and a humanity through addressing is sues such as community heritage, social justice, and conservation biology. Students will develop a project that shares the benefits of archaeology with the public.
Also offered for graduate-level credit as Anth 560 and may be taken only once for credit. . Prerequisite: Upper division standing.

## Anth 461 - Advanced Topics in Archaeology (4)

In-depth exploration and analysis of a major current problemin archaeology. Problems may be substantive or theoretical.

Also offered for graduate-level credit as Anth 561. Prerequisite: Upper division standing.

## Anth 464 - Topics in Northwest Archaeology (4)

In-depth exploration of current problems in the study of Northwest Prehistory, particularly as it articulates with general theories of hunter-gatherer adaptations and cultural evolution. Expected preparation: Anth 364.

Also offered for graduate-level credit as Anth 564. . Prerequisite: Anth 350.

Anth 471 - Advanced Topics in Paleoanthropology (4)
In-depthexploration and analy sis of current is sues and debates in Paleoanthropology. Rotating focus on different human and primate lineages within different geological time frames. Emphas is on articulation of evolutionary theory with paleontology, prehistoric archaeology, genetics, and other relevant fields of inquiry.

Also offered for graduate-level credit as Anth 571. . Prerequisite: Upper division standing.

## Anth 472 - The Roots of Human Biology (4)

Human biology within an evolutionary framework integrating ecology, behavior, and genetics. Evolutionary and bio-cultural approaches for interpreting genotypic and phenotypic variation. Population-level adaptations involving climate, latitude, altitude, subsistence pattern, and diet. Human life history (reproduction, development,
growth, and aging). Human health and disease; Darwinian medicine.

Also offered for graduate-level credit as Anth 572 and may be taken only oncefor credit. . Prerequisite: Upper division standing.

## Anth 473 -Primatology (4)

Primate biology. Phylogenetic reconstruction of the Order Primates anchored within Mammalia. Comparative study of diets and dentitions, the skull and major sense organs, the central nervous system, reproduction, and locomotor patterns among living primates. Integration of ecological and behavioral studies and the primate fossil record. Expected preparation: Anth 373 or Bi 328 or Bi 415.
Also offered for graduate-level credit as Anth 573 and may be taken only once forcredit. Prerequisite: Upper-division standing.

## Anth 477 - Primatology Field Methods (4)

Methods for collecting behavioral and ecological dataon free-ranging primates through a combination of field exercises and lectures. Curriculumincludes development of ethograms, sampling methods and recording rules, mapping, and estimating resource av ailability. Methods learned within a natural reserve setting populated by living primates.
Also offered for graduate-level credit as Anth 577 and may be taken only once forcredit. .Prerequisite: Upper division standing.

## Anth 478-Human Osteology (4)

The identification and interpretation of human skeletal material from paleontological, archaeological, and modern contexts. Focus on mastery of human skeletal and dental anatomy; estimation of age and sex; introduction to paleopathology, pre-and peri-mortemmodification, and taphonomy. Ethics in the study of human skeletal remains.
Also offered for graduate-level credit as Anth 578 and may be taken only once for credit. .Prerequisite: Upper division standing.

## Anth 479 - Forensic Anthropology (4)

Methods of forensic anthropology including advanced techniques of human skeletal identification and their application to the solution of medico-legal problems.
Also offered for graduate-level credit as Anth 579 and may be taken only once forcredit. .Prerequisite: Upper division standing.

## Anth 490 - The Anthropology of Violence (4)

Theoretical and ethnographic exploration of the nature of violence. Topics include identity politics and nationalism; the biology of ag gression and thecultural meanings of
pain; state violence; symbolic and structural violence; and human rights.

Also offered for graduate-level credit as Anth 590 and may be taken only once for credit. . Prerequisite: Upper division standing.

## Anth 491-Culture, Vulnerability and Disaster Resilience (4)

This class discusses the distinctions between natural hazards and dis asters, human-made and natural events, and sudden and slow-moving catastrophes. It considers the effects of preexisting social inequalities (e.g., race) and vulnerabilities (e.g., poverty) and examines individual, household, and community resilience as a function of social net works and social capital. The class also explores the roles of perceived risk, connectivity, and social memory. It concludes with an analysis on the successes and failures of humanitarian aid.
Also offered for graduate-level credit as Anth 591. Prerequisite: Upper-division standing.

## Anth 501 - Research (1-9)

See department for course description. Consent of instructor. (Credit to be arranged.)

Anth 502 - Independent Study (1-12)
(Credit to be arranged.)

## Anth 503 -Thesis (1-9)

See department for course description. (Credit to be arranged.)

Anth 504-Cooperative Education/internship(1-9)
See department for course description. (Credit to be arranged.)

## Anth 505-Reading and Conference (1-6)

See department for course description. Consent of instructor. (Credit to be arranged.)

Anth 506-Special Projects (1-9)
Credit to be arranged.

## Anth 507-Seminar (1-6)

See department for course description. Consent of instructor. (Credit to be arranged.)

Anth 509-Practicum(1-9)<br>(Credit to be arranged.)

## Anth 510 -SelectedTopics (1-4)

See department for course description. Consent of instructor. (Credit to be arranged.)

## Anth 511 - Core Seminar in Social and Cultural Anthropology (4)

A seminar that provides a methodological, theoretical, and substantive review and integration of anthropological materials in social and cultural anthropology.
Prerequisite: graduate standing in anthropology and consent of instructor.

## Anth 512 -Ethnographic Methods (4)

Practical coursework and community-based experience in research design and qualitative methodology. Students conceptualize and implement research projects, gather and analyze data, and write a proposal for hypothetical future research. Essential training for basic ethnographic research and applied projects.
Also offered for undergraduate-level credit as Anth 412 and may be taken only once for credit. .

## Anth 514 - Culture and Ecology (4)

A critical analys is of the interrelations of culture, social structure, and humanecology. Social organization as influenced by characteris tic patterns of resource exploitation. The uses of natural environment fromthe viewpoint of the members of societies.
Also offered for undergraduate-level credit as Anth 414 and may be taken only once for credit. .

## Anth 515-Applied Anthropology (4)

Examines theories, methods, andethical considerations required to conduct applied anthropology in a variety of contexts. Students will carry out independent research on a real world problemlinked with his/her career goal.
Also offered for undergraduate-level credit as Anth 415 and may be taken only once for credit. . Prerequisite: Anth 304 or Anth 305.

## Anth 516 - Urban Anthropology (4)

Global examination of urban phenomena including:spatial design of urban built environments, the production of locality, urban political activism, ideas of cosmopolitanis $m$, racial segregation, violence, migration,
informal economies, subcultures, and new technologies that impact social relations in cities across the world.
Also offered for undergraduate-level credit as Anth 416 and may be taken only once forcredit. .

## Anth 517 -Advanced Topics in Native American Studies (4)

In-depthexamination of a current scholarly topic in the anthropology of Native North America, es pecially in relation to colonialismand Nativeres istance. Course will cover appropriate theory, as well as ethnographic and ethnohistorical materials.
Also offered for undergraduate-level credit as Anth 417..
Anth 518 -Environmental Anthropology (4)
What can anthropology teach us about contemporary environmental problems? Emphasizing key is sues of environmentalchange, adaptation, conservation and sustainability, biocultural diversity, resilience, political ecology, and environmentaljustice, this course examines how the cross-cultural study of human-environmental relations can improve our understanding of contemporary environmental problems and their solutions.
Also offered for undergraduate-level credit as Anth418 and may be taken only once for credit. .

## Anth 522 - Tribal Sovereignty and Policy (4)

An examination of current federal, state, and tribal law and policy pertaining to Indian affairs, including tribal government organization, government-to-government relations, economic development, natural and cultural resource management, health care, welfare, and education. Both reservation communities and the Portland metropolitan Indian community are considered. Student research is based on reading, field trips, and interviews with tribal officials and other policy professionals.
Also offered for undergraduate-level credit as Anth 422 and may be taken only once forcredit. .
Anth 525-Topics in Medical Anthropology (4)
In-depth exploration of contemporary US and global health is sues through critical, interpretive, biocultural, and ecological perspectives. Rotating topics may include but are not limited to pandemics and epidemics, emerging illnesses, food systems, new medical technologies, social meanings of the body and illness identities, patient activism, public health interventions, health-care policy, bioethics, and the medicalization of social problems. This course may be repeated once forcredit.
Also offered for undergraduate-level credit as Anth 425 and may be taken only once forcredit. .

## Anth 526 - Transnationalism and Migration (4)

In-depth exploration of globalization, transnationalism, and migration. Topics include colonialismand the history of world connections, the globaleconomic system, cultural imperialism, nationalismand identity, migration, refugees, touris $m$, and the commodification of local cultures.

Also offered for undergraduate-level credit as Anth426 and may be taken only once for credit. .
Anth 528 - Political Anthropology (4)
Survey of major anthropological approaches to politics, power, activismand social change, examined in light of historical and contemporary social tensions around the world. Emphasis on decolonization, politicaleconomy, feminist, and critical race theories.

Also offered for undergraduate-levelcredit as Anth428 and may be taken only once for credit. .
Anth 530-Myth, Ritual, and Symbol (4)
A critical examination of both classic and recent anthropological theories in the cross-cultural study of symbolic forms.
Also offered for undergraduate-levelcredit as Anth430 and may be taken only once for credit. .

Anth 531 - Topics in Latin American in Ethnography (4)

In-depthexploration of a current topic in Latin American and Caribbean anthropology, especially in relation to power, structural inequality and violence, cultural identities, social movements, the State, and postcolonial his tories. Course materials will cover both theory and ethnography.
Also offered for undergraduate-levelcredit as Anth 431..
Anth 532 - Gender, Sex, and Sexuality in Anthropological Perspectives (4)

A theoretical introduction to gender, sex, and sexuality, including ethnographic examples fromaround the world. Explores biological and social as pects of sexand gender as they intersect with race, clas s, and nationality. Examines how gender relates to care work, kinship, and social reproduction. Considers transnational migration, surveillance, biopower, and political battles over reproductive technologies, gender-affirmative surgery, and sex work.

Also offered for undergraduate-levelcredit as Anth432 and may be taken only once for credit. .

## Anth 535 - Visual Anthropology (4)

Examination of visual representation and visual research in Sociocultural Anthropology with a focus on photographic images, ethnographic films, and mass media.

Also offered for undergraduate-level credit as Anth435 and may be taken only once for credit. .

## Anth 540 - Design Anthropology (4)

Explores the relationship between anthropology and design. Addresses how anthropologists collaborate with designers in industry to develop new products. Students apply ethnographic methods to do rapid design research and develop prototypes of products and services. The course is usefulfor students interested in human centered approaches to problemsolving and for students pursuing a career in designing innovative products or doing user experience research.
Also offered for undergraduate-level credit as Anth440 and may be taken only once forcredit.

Anth 547 - Advanced Topics in Asian Anthropology (4)
In-depth exploration of a current topic in Asian anthropology, especially in relation to social change, nationalis mand conflict, colonialis $m$, or modernization. Course materials will cover both theory and ethnography.

Also offered for undergraduate-level credit as Anth 447. .
Anth 550 - Core Seminar in Archaeology (4)
A seminar that provides a methodological, theoretical, and substantive review and integration of anthropological materials in archaeology.
Prerequisite: graduatestanding in anthropology and consent of instructor.

## Anth 551 - History of Archaeology (4)

A chronological survey of developments in the field of archaeological inquiry: major schools of thoughts, innovations in method and theory, key personalities and their contributions.

Also offered for undergraduate-level credit as Anth451 and may be taken only once for credit. . Prerequis ite: Graduate standing or ins tructor permis sion.
Anth 552 - Archaeological Lab Methods (4)
Learn and practice archaeological lab methods and techniques through analysis of common materials (e.g. lithics, ceramics) recovered from archaeological sites.

Also offered for undergraduate-level credit as Anth452 and may be taken only once for credit. . Prerequis ite: Graduate standing or ins tructor permis sion.
Anth 553 - Archaeological FieldMethods (4)
Learn the theory, methods, and practice of archaeological field work. Topics include research design, survey and reconnaissance, site excavation, sampling and recording techniques, mapping, and cultural res ource management.

Also offered for undergraduate-levelcredit as Anth453 and may be taken only once for credit. . Prerequisite: Graduate standing or ins tructor permis sion.

## Anth 554 - Archaeological FieldSchool (6)

Engage in the scientific survey, mapping, and excavation of archaeological sites during a summer field project. Students will also gain training and experience in public engagement. Approximately 40 hours of field work per week, with a week of laboratory work.

Also offered for undergraduate-level credit as Anth454 and may be taken only once for credit. . Prerequis ite: Admis sion to course is by permission of instructor via an application process.

## Anth 555-Analysis of Faunal Remains (5)

Reviews is sues of recovery, identification, quantification, and interpretation of archaeological faunal remains. Seminar component in volves dis cussion and critical review of recent faunal studies. Laboratory component introduces student to skeletal anatomy of vertebrates (with focus on fishes and mammals) and basic procedures used in faunal analys is.
Also offered for undergraduate-levelcredit as Anth 455 and may be taken only once for credit. . Prerequis ite: Graduate standing or ins tructor permis sion.

## Anth 556 - Cultural and Heritage Resource Management (4)

Introduction to the preservation, conservation, and management of cultural and heritage res ources in North America, including the legal and regulatory frameworks. Topics include agency and private-sector archaeology, laws affecting antiquities trafficking, consultation with American Indian tribes and other stakeholders, traditional cultural properties, and landscape.
Also offered for undergraduate-levelcredit as Anth 456. . Prerequisite: Graduate standing or instructor permis sion.
Anth 557 - The Archaeology of Hunter-Gatherers (4)
An inves tigation of the economic and social diversity among modern and ancient hunter-gatherers and the theories and methods used by archaeologists to investigate and explain that diversity. Examines topics such as the evolution of hunting and gathering, hunter-gatherer settlement and mobility strategies, social complexity among hunter-gatherers and hunter-gatherers in the modem world.

Also offered for undergraduate-level credit as Anth457 and may be taken only once for credit. . Prerequisite: Graduate standing or instruc tor permis sion.
Anth 558 - The Archaeology of Disaster (4)
Examine archaeological approaches to studying human responses to past disasters, both natural and human-made,
and the application of archaeology to contemporary dis aster preparedness and related is sues. Topics include past human-environment interactions, climate change, vulnerability, risk, and resilience.
Also offered for undergraduate-level credit as Anth458 and may be taken only once forcredit. . Prerequisite: Graduate standing or ins tructor permis sion.
Anth 560 - Public and Community Archaeology (4)
Reviews ways archaeology contributes to the modern world as a science and a humanity through addressing is sues such as community heritage, social justice, and conservation biology. Students will develop a project that shares the benefits of archaeology with the public.
Also offered for undergraduate-level credit as Anth460 and may be taken only once for credit.

## Anth 561 - Advanced Topics in Archaeology (4)

In-depthexploration and analy sis of a major current problemin archaeology. Problems may be substantive or theoretical.

Also offered for undergraduate-level credit as Anth 461.. Prerequisite: Graduate standing or ins tructor permis sion.

## Anth 564 - Topics in Northwest Archaeology (4)

In-depth exploration of current problems in the study of Northwest Prehistory, particularly as it articulates with general theories of hunter-gatherer adaptations and cultural evolution. Expected preparation: Anth 364.
Also offered for undergraduate-level credit as Anth 464. . Prerequisite: Graduate standing or instructor permis sion.

## Anth 570 - Core Seminar in Physical Anthropology (4)

A seminar that provides a methodological, theoretical, and substantive review and integration of anthropological materials in physical anthropology.
Prerequisite: graduatestanding in anthropology and consent of instructor.

## Anth 571 - Advanced Topics in Paleoanthropology (4)

In-depth exploration and analysis of current is sues and debates in Paleoanthropology. Rotating focus on different human and primate lineages within different geological time frames. Emphasis on articulation of evolutionary theory with paleontology, prehistoric archaeology, genetics, and other relevant fields of inquiry.
Also offered for undergraduate-level credit as Anth 471..
Anth 572 - The Roots of Human Biology (4)
Human biology within an evolutionary framework integrating ecology, behavior, and genetics. Evolutionary and bio-cultural approaches for interpreting genotypic and phenotypic variation. Population-level adaptations
involving climate, latitude, altitude, subsistence pattern, and diet. Human life history (reproduction, development, growth, and aging). Human health and disease; Darwinian medicine.

Also offered for undergraduate-levelcredit as Anth 472 and may be taken only once for credit. .

## Anth 573 - Primatology (4)

Primate biology. Phylogenetic reconstruction of the Order Primates anchored within Mammalia. Comparative study of diets and dentitions, the skull and major sense organs, the central nervous system, reproduction, and locomotor patterns among living primates. Integration of ecological and behavioral studies and the primate fossil record. Expected preparation: Prior course work in anatomy, ecology, behavior or evolutionary biology.

Also offered for undergraduate-levelcredit as Anth473 and may be taken only once for credit.

## Anth 577 - Primatology Field Methods (4)

Methods for collecting behavioral and ecological dataon free-ranging primates through a combination of field exercises and lectures. Curriculumincludes development of ethograms, sampling methods and recording rules, mapping, and estimating resource availability. Methods learned within a natural reserve setting populated by living primates.
Also offered for undergraduate-levelcredit as Anth477 and may be taken only once for credit. . Prerequisite: Graduate level standing or permis sion of instructor.

## Anth 578 - Human Osteology (4)

The identification and interpretation of human skeletal material from paleontological, archaeological, and modern contexts. Focus on mastery of human skeletal and dental anatomy; estimation of age and sex; introduction to paleopathology, pre- and peri-mortemmodification, and taphonomy. Ethics in the study of human skeletal remains.

Also offered for undergraduate-levelcredit as Anth478 and may be taken only once for credit. .
Anth 579 - Forensic Anthropology (4)
Methods of forensic anthropology including advanced techniques of human skeletal identification and their application to the solution of medico-legal problems.
Also offered for undergraduate-levelcredit as Anth479 and may be taken only once for credit. .

## Anth 590 - The Anthropology of Violence (4)

Theoretical and ethnographic exploration of the nature of violence. Topics include identity politics and nationalism; the biology of ag gression and thecultural meanings of pain; state violence; symbolic and structural violence; and human rights.

Also offered for undergraduate-level credit as Anth490 and may be taken only once for credit. .

## Anth 591-Culture, Vulnerability and Disaster Resilience (4)

This class discusses the distinctions between natural hazards and dis asters, human-made and natural events, and sudden and slow-moving catastrophes. It considers the effects of preexisting social inequalities (e.g., race) and vulnerabilities (e.g., poverty) and examines individual, hous ehold, and community resilience as a function of social net works and social capital. The class also explores the roles of perceived risk, connectivity, and social memory. It concludes with an analysis on the successes and failures of humanitarian aid.

Also offered for undergraduate-level credit as Anth491. Cross-Listed as: This is the same course as EMCR 591.

## Ar - Arabic

## Ar 101 - First-Year Standard Arabic Term 1 (4)

Introduction to modern literary (fus -ha) Arabic: Emphas is on reading and writing the cursive Arabic script, accurate pronunciation, comprehension of basic texts, translation, vocabulary, dictation, basic grammar and syntax, writing Arabic compositions, and media to facilitate the learning of simple communications in standard spoken Arabic. This is the first course in a sequence of three: $\operatorname{Ar} 101, \operatorname{Ar} 102$, and Ar 103. For non-native speakers of Arabic only.

## Ar 102 - First-Year Standard Arabic Term 2 (4)

Introduction to modern literary (fus -ha) Arabic: Emphas is on reading and writing the cursive Arabic script, accurate pronunciation, comprehension of basic texts, translation, vocabulary, dictation, basic grammar and syntax, writing Arabic compositions, and media to facilitate the learning of simple communications in standard spoken Arabic. This is the second course in a sequence of three: Ar 101, Ar 102, and Ar 103. For non-native speakers of Arabic only.

## Ar 103 - First-Year Standard Arabic Term 3 (4)

Introduction to modern literary (fus-ha) Arabic: Emphas is on reading and writing the cursive Arabic script, accurate pronunciation, comprehension of basic texts, translation, vocabulary, dictation, basic grammar and syntax, writing Arabic compositions, and media to facilitate the learning of simple communications in standard spoken Arabic. This is the third course in a sequence of three: Ar 101, Ar 102, and Ar 103. For non-native speakers of Arabic only.

## Ar 199 -Special Studies (1-4)

(Credit to be arranged.)

## Ar 201 -Second-Year Standard Arabic Term 1 (4)

Continued work in modern literary Arabic: Emphas is on reading prose texts dealing with the popularstandard language, expanded grammar and syntax, writing Arabic compositions, translation, enhanced vocabulary, dictation, and media for better listening comprehension of standard spoken Arabic, for expanded conversations dealing with daily life. This is the first course in a sequence of three: Ar 201, Ar 202, and Ar 203.
Prerequisite: Ar 103. For non-native speakers of Arabic only.

## Ar 202 -First-Year Standard Arabic Term 2 (4)

Continued work in modern literary Arabic: Emphas is on reading prose texts dealing with the popularstandard language, expanded grammar and syntax, writing Arabic compositions, translation, enhanced vocabulary, dictation, and media for better listening comprehension of standard spoken Arabic, for expanded conversations dealing with daily life. This is the second course in a sequenceof three: Ar 201, Ar 202, and Ar 203.

Prerequisite: Ar 103. For non-native speakers of Arabic only.

## Ar 203 -First-Year Standard Arabic Term 3 (4)

Continued work in modern literary Arabic: Emphas is on reading prose texts dealing with the popularstandard language, expanded grammar and syntax, writing Arabic compositions, translation, enhanced vocabulary, dictation, and media for better listening comprehension of standard spoken Arabic, for expanded con versations dealing with daily life. This is the third course in a sequence of three: Ar 201, Ar 202, and Ar 203.

Prerequisite: Ar 103. For non-native speakers of Arabic only.

## Ar 299 -Special Studies (1-12)

(Credit to be arranged.)

## Ar 301 - Third-Year Standard Arabic Term 1 (4)

Intermediate modern literary Arabic prose: Emph as is on reading prose texts dealing with a wide spectrum of dailylife topics in their social-cultural context; advanced grammar and syntax (weak verbs, weak nouns, doubled verbs, verb moods, and the conditional); translation of complex texts, writing expanded Arabic compositions; media and Arabic web-sites to enhanceconversational skills. This is the first course in a sequence of three: Ar 301, Ar 302, and Ar303.

## Ar 302 - Third-Year Standard Arabic Term 2 (4)

Intermediate modern literary Arabic prose: Emphasis on reading prose texts dealing with a wide spectrumof dailylife topics in their social-cultural context; advanced grammar and syntax(weak verbs, weak nouns, doubled verbs, verb moods, and the conditional); translation of complex texts, writing expanded Arabic compositions; media and Arabic web-sites to enhance conversational skills. This is the second course in a sequence of three: Ar 301, Ar 302, and Ar 303.

## Ar 303 - Third-Year Standard Arabic Term 3 (4)

Intermediate modern literary Arabic prose: Emphasis on reading prose texts dealing with a wide spectrum of dailylife topics in their social-cultural context; advanced grammar and syntax (weak verbs, weak nouns, doubled verbs, verb moods, and the conditional); translation of complex texts, writing expanded Arabic compositions; media and Arabic web-sites to enhance conversational skills. This is the third course in a sequence of three: Ar 301, Ar 302, and Ar 303.

## Ar 304-Common Spoken Arabic Term 1 (4)

Practical pan-Arab spoken Arabic used in social, intellectual gatherings and business in lieu of limited local spoken "dialects," or the fus-ha (literary Arabic), understandable and usable anywhere in the Arab world. Fornon-native speakers of Arabic only. This is the first course in a sequence of three: $\operatorname{Ar} 304, \operatorname{Ar} 305$, and $\operatorname{Ar} 306$.

Prerequisite: Ar 203 or consent of Instructor.

## Ar 305-Common Spoken Arabic Term 2 (4)

Practical pan-Arab spoken Arabic used in social, intellectual gatherings and business in lieu of limited local spoken "dialects," or the fus-ha (literary Arabic), understandable and usable anywhere in the Arab world. Fornon-native speakers of Arabic only. This is the second course in a sequence of three: $\operatorname{Ar} 304, \operatorname{Ar} 305$, and $\operatorname{Ar} 306$.

Prerequisite: Ar 203 and Ar 304.

## Ar 306-Common Spoken Arabic Term 3 (4)

Practical pan-Arab spoken Arabic used in social, intellectual gatherings and business in lieu of limited local spoken "dialects," or the fus-ha (literary Arabic), understandable andusable anywhere in the Arab world. For non-native speakers of Arabic only. This is the third course in a sequence of three: $\operatorname{Ar} 304, \operatorname{Ar} 305$, and $\operatorname{Ar} 306$.
Prerequisite: Ar 203 and Ar 305.

## Ar 311 - Intermediate Media Arabic (4)

Reading and translating intermediate-level Arabic newspaper and journal materials; viewing selected media and news websites. For non-native speakers of Arabic only. Does notreplace Ar301, Ar 302, Ar 303.
Prerequisite: Ar 301, Ar 302, Ar 303.

## Ar 330 - Topics in Arab Culture and Civilization (4)

Survey of the development of culture, thought, and the arts in the Arab world, frompre-Is lamic times to the present with focus on particular themes or periods. Does not replace 301, 302, 303.Taught in English.

## Ar 331 - Arabic Calligraphy: Reading and Writing (4)

Introduction to Arabic script since the fifth century A.D.; presentation of early prominent pens and styles; reading various exhibits covering all major styles; mas tering the writing of the ruq'ah style. Does not replace Ar301, Ar 302, Ar 303.

Prerequisite: Ar 203 or consent of instructor.

## Ar 360 - Arab Cinema (4)

Focus on conversation and writing skills through the viewing and discussion offilms. Topics may include: history of Arab and Arabophone cinema; Arabic literature through film; social themes such as gender, sexuality, national identity; and representations of war and colonialis min Arab cinema. Taught in English.

## Ar 399 -Special Studies (1-6)

(Credit to be arranged.)

## Ar 401 - Research (1-6)

(Credit to be arranged.)

## Ar 404 - Cooperative Education/Internship (1-12)

(Credit to be arranged.)

## Ar 405 - Reading and Conference (1-12)

(Creditto be arranged.)

## Ar 409-Practicum(1-6)

(Credit to be arranged.)

## Ar 410 -SelectedTopics (1-6)

(Credit to be arranged.)

## Ar 411 - Advanced Arabic (4)

Reading, discussing and translating advanced Arabic texts by prominent Arab authors in various genres presenting cultural, literary, and politicaltopics.
Also offered for graduate-level credit as Ar 511 and may be taken only once for credit. . Prerequisite: Ar 303 or consent of instructor.

## Ar 413 - Advanced Modern Standard Arabic: Short Story and Novel (4)

Reading modern Arabic shortstories, condensed novels, or short biographies of prominent Arab authors; viewing related films; writing critiques in Arabic. This course is not taughtevery year.
Also offered for graduate-level credit as Ar 513 and may be taken only once for credit. . Prerequisite: Ar 303 or consent of instructor.

## Ar 414 - Advanced Arabic Grammar (4)

The use of the critical connectors of the standard Arabic grammar and the major rules of the Arabic syntax.

Also offered for graduate-level credit as Ar 514 and may be taken only once for credit. . Prerequisite: Ar 411 or Ar 511 or consent of instructor.

## Ar 419 - Folk Proverbs of the Arabs (4)

Reading and analyzing Arabic folk proverbs representing a wide range of critical social-cultural is sues and moral values; writing critiques.
Also offered for graduate-level credit as $\operatorname{Ar} 519$ and may be taken only once for credit. . Prerequisite: Ar 301 and Ar 304 or consent of instructor.

## Ar 420 - Folk Tales of the Arabs (4)

Introduction to the oral tradition of the Arabs since early times; analy sis of selected folk tales; viewing cultural videos; writing short critiques.

Also offered for graduate-level credit as Ar 520 and may be taken only once for credit. . Prerequisite: Ar 303 and Ar 304 or consent of ins tructor.

Ar 421 - Extemporized-sung Poetry and Folk Songs of the Arabs (4)

Reading, translating, and analyzing texts of extemporizedsung folk poetry (zajal) covering major genres and lyrics of folk songs composed in vernacular Arabic; viewing videos of social occasions where these genres are performed. Conducted in English.

Also offered for graduate-level credit as Ar 521 and may be taken only once forcredit. .Prerequisite: Ar 303 \& Ar 306 or consent of instructor.

## Ar 423 -Modern Arabic Poetry (4)

Reading, translating, and analyzing selected modern Arabic poems fromprominent Arab poets covering a wide range of issues and genres; writing critical analy sis of poems.
Also offered for graduate-level credit as Ar 523 and may be taken only once for credit. .Prerequisite: Ar 303 or consent of instructor.

## Ar 424-Classical Arabic Poetry (4)

Reading, translating, and analyzing selected texts of classical Arabic poems fromprominent Arab poets of early Arabia and al-Andalus covering a wide range of major is sues; writing critical analysis of poems.
Also offered for graduate-level credit as Ar 524 and may be taken only oncefor credit. .Prerequisite: Ar 303 or consent of instructor.

## Ar 427 - Classical Arabic Prose (4)

Introduction to the his tory of Arabic prose (7th - 18th century AD); reading selected texts fromclassic literary works of major authors such as Ibn al-Muqaffa', al-Jahiz, al-Isfahani, Ibn 'Adiy, and Ibn 'Abd Rabbuh; translating texts and writing literary reviews in Arabic.
Also offered for graduate-level credit as Ar 527 and may be taken only once forcredit. . Prerequisite: Ar 303 or consent of instructor.

## Ar 441U- Major Arabic Works in Translation (4)

Study of selected masterpieces of Arabic literature in English trans lation: short stories, women's essays, poetry, folk literature, and introduction to Arabculture. Viewing critical films and videos. Lectures and dis cussions in English. Expected preparation: 4 credits of upper division literature. Course may be repeated for credit if content varies. Expected preparation: 4 credits of upper-division literature.

## Ar 490 -History of the Arabic Language (4)

Study of the development of clas sical Arabic language from early times, with emphas is on two major schools of Arabic grammar: al-Kufah and al-Basrah; contribution of major grammarians, evolution of morphology and syntax; development of current Modern Standard Arabic vs colloquialSpoken Arabic.
Also offered for graduate-level credit as Ar 590 and may be taken only onceforcredit. .Prerequisite: Ar 303 or consent of instructor.

## Ar 510 -SelectedTopics (1-6)

(Credit to be arranged.)

## Ar 511 - Advanced Arabic (4)

Reading, discussing and translating advanced Arabic texts by prominent Arab authors in various genres presenting cultural, literary, and politicaltopics.
Also offered for undergraduate-level credit as Ar411 and may be taken only once for credit.

## Ar 513 - Advanced Modern Standard Arabic: Short Story and Novel (4)

Reading modern Arabic shorts tories, condensed novels, or short biographies of prominent Arab authors; viewing related films; writing critiques in Arabic. This course is not taughtevery year.
Also offered for undergraduate-level credit as Ar 413 and may be taken only once for credit.

## Ar 514 - Advanced Arabic Grammar (4)

The use of the critical connectors of the standard Arabic grammar and the major rules of the Arabic syntax.

Also offered for undergraduate-level credit as Ar 414 and may be taken only once for credit. . Prerequisite: Ar 411 or Ar 511 or consent of instructor.

Ar 519 - Folk Proverbs of the Arabs (4)
Reading and analyzing Arabic folk proverbs representing a wide range of critical social-cultural is sues and moral values; writing critiques.

Also offered for undergraduate-level credit as Ar 419 and may be taken only once for credit. . Prerequisite: Ar301 and Ar304 or consent of instructor.

## Ar 520 - Folk Tales of the Arabs (4)

Introduction to the oral tradition of the Arabs since early times; analy sis of selected folk tales; viewing cultural videos; writing short critiques.
Also offered for undergraduate-level credit as Ar 420 and may be taken only once for credit. . Prerequisite: Ar 303 and Ar304 or consent of instructor.

Ar 521 - Extemporized-sung Poetry and Folk Songs of the Arabs (4)

Reading, translating, and analyzing texts of extemporizedsung folk poetry (zajal) covering major genres and lyrics of folk songs composed in vernacular Arabic; viewing videos of social occasions where these genres are performed. Conducted in English.

Also offered for undergraduate-level credit as Ar 421 and may be taken only once for credit.

## Ar 523 - Modern Arabic Poetry (4)

Reading, translating, and analyzing selected modern Arabic poems from prominent Arab poets covering a wide range of issues and genres; writing critical analy sis of poems.
Also offered for undergraduate-levelcredit as Ar 423 and may be taken only once for credit.

## Ar 524 - Classical Arabic Poetry (4)

Reading, translating, and analyzing selected texts of classical Arabic poems from prominent Arab poets of early Arabia and al-Andalus covering a wide range of major is sues; writing critical analysis of poems.
Also offered for undergraduate-levelcredit as Ar 424 and may be taken only once for credit.

## Ar 527 - Classical Arabic Prose (4)

Introduction to the history of Arabic prose (7th - 18th century AD); reading selected texts fromclassic literary works of major authors such as Ibn al-Muqaffa', al-Jahiz, al-Isfahani, Ibn 'Adiy, and Ibn 'Abd Rabbuh; translating texts and writing literary reviews in Arabic.
Also offered for undergraduate-levelcredit as Ar 427 and may be taken only once for credit. .

## Ar 590 -History of the Arabic Language (4)

Study of the development of classical Arabic language from early times, with emphas is on two major schools of Arabic grammar: al-Kufah and al-Basrah; contribution of major grammarians, evolution of morphology and syntax; development of current Modern Standard Arabic vs colloquialSpoken Arabic.
Also offered for undergraduate-levelcredit as $\operatorname{Ar} 490$ and may be taken only once for credit.

## Arch - Architecture

## Arch 100 - Introduction to Architecture (4)

Introductory course designed to introduce concepts, theories, and practices of the discipline of architecture. Includes a study of perceptual, environmental, technical, and org anizational concepts through lectures and individual projects in observing architectural spaces and forms. Open to non-majors.

## Arch 101 - Introduction to Environmental Design (4)

Concepts and theories of the fields of environmental and sustainable design. Includes a study of perceptual, technical, and philosophical concepts of natural and built resources through lectures, design projects, and individual projects. Open to non-majors.

## Arch 102 - Introduction to Landscape Architecture (4)

Introductory course designed to introduce concepts, theories and practices of the discipline of landscape architecture. Includes a study of the perceptual, environmental, technical and organizational concepts through lectures and individual projects in observing landscape spaces and forms.

## Arch 120 -Visual Communication 1 (4)

An introduction to freehand drawing focused on the delineation of both interior and exterior space, starting with direct observation through to conceptual drawings of imagination. Use of different media and color including the study of light and light qualities. Open to non-majors.

## Arch 121 - Visual Communication 2 (4)

Develops skills in graphic visualization, representation, and communication as used in architecture and related design fields. Concepts and conventions, fromfreehand to digital media and production, used as a means to imagine, develop and represent design ideas.
Prerequisite: Arch 120.

## Arch 198 - Metal Shop Skills Workshop(1)

Basic metal working skills, including cutting, welding, blacksmithing and safety protocols.
Prerequisite: Arch 281.

## Arch 199 -Special Studies (0-12)

See department for course description. (Credit to be arranged.)

## Arch 202 - Project Management II (6)

Series of courses designed to develop in students cons truction project management techniques for profitable construction administration. Students will demonstrate knowledge of course material by completing projects in light cons truction adminis tration. Coursework includes utilization of estimating, critical path, and presentation computer software relevant to current practices. Arch 202: developing standards of performance, bidding, contracts and liability, production scheduling, and techniques for controlling a profitable construction project. This is the second course in a sequence of two: Arch 201 and Arch 202 which must be taken in sequence.

Prerequisite: Building construction certificate program, instructor's consent, or equivalent.

## Arch 225 - Digital Graphics (4)

A beginning computer graphics course that develops skills in digital design, visualization, representation and communication. Concepts and conventions are introduced as tools for rigorous design investigations.
Prerequisite: Arch 121.

## Arch 230 - Architecture and Cultural History I (4)

A series of courses tracing the his tory of architecture understood as a cultural product from the early Paleolithic Age up to the 20th century. The first course covers from the early Stone Age up to the Iron Age, the second course begins in the 1st century C.E. to cover up to the 19th century, and the third course addresses the 20th century. The courses will focus on a select number of architectural works that are representative of specific cultural beliefs, values, and ideologies in a global context as embodied in architectonic forms and experiences. This is the first course in a sequence of three: Arch 230, Arch 231, and Arch 232 which must be taken in sequence.

## Arch 231 - Architecture and Cultural History II (4)

A series of courses tracing the his tory of architecture understood as a cultural product from the early Paleolithic Age up to the 20th century. The first coursecovers from the early Stone Age up to the Iron Age, the second course begins in the 1st century C.E. to cover up to the 19th century, and the third course addresses the 20th century. The courses will focus on a select number of architectural works that are representative of s pecific cultural beliefs, values, and ideologies in a global context as embodied in architectonic forms and experiences. This is the second course in a sequence of three: Arch 230, Arch 231, and Arch 232 which must be taken in sequence.

## Arch 232 - Architecture and Cultural History III (4)

A series of courses tracing the his tory of architecture understood as a cultural product from the early Paleolithic Age up to the 20th century. The first coursecovers from the early Stone Age up to the Iron Age, the second course begins in the 1st century C.E. to cover up to the 19th century, and the third course addresses the 20th century. The courses will focus on a select number of architectural works that are representative of s pecific cultural beliefs, values, and ideologies in a global context as embodied in architectonic forms and experiences. This is the third course in a sequence of three: Arch 230, Arch 231, and Arch 232 which must be taken in sequence.

## Arch 280 - Design Fundamentals Studio 1 (6)

Foundational design studio sequence initiating awareness of the creative language of architecture through practical as signments in drawing, modeling, and artful making. The communication of perceptions and imaginative propositions through the use of diverse media is encouraged. Includes individual criticism, lectures, and seminar discussions. This is the first course in a sequence of two: Arch 280 and Arch 281 which must be taken in sequence.

Prerequisite: Arch 121.

## Arch 281 - Design Fundamentals Studio 2 (6)

Foundational design studio sequence initiating awareness of the creative language of architecture through practical as signments in drawing, modeling, and artful making. The communication of perceptions and imaginative propositions through the use of diverse media is encouraged. Includes individual criticism, lectures, and seminardiscussions. This is the second course in a sequence of two: Arch 280 and Arch 281 which must be taken in sequence.
Prerequisite: Arch 280.

## Arch 283 - Architecture Summer Immersion Program (6)

Intensive four-week course providing foundational skills in design and visual communication for students considering an education and/or career in architecture. Design work in this intensive studio setting is supplemented with lectures on tectonics and public interest design, site vis its to significant architecture in the region, and tours of leading architecture firms. Open to all students at the college level or above.

## Arch 299 -Special Studies (1-6)

(Credit to be arranged.)

## Arch 360 - Building Tectonics 1 (4)

A three-quarter sequence introducing technologies in volved in the design and construction of buildings. Topics include construction materials and methods, envelope design, mechanical systems, thermal, and other environmental building systems. This is the first course in a sequence of three: Arch 360, Arch 361, and Arch 362 which must be taken in sequence.

Prerequisite: Arch 281.

## Arch 361 - Building Tectonics 2 (4)

A three-quarter sequence introducing technologies involved in the design and construction of buildings. Topics include construction materials and methods,
envelopedesign, mechanical systems, thermal, and other environmental building systems. This is the second course in a sequence of three: Arch 360, Arch 361, and Arch 362 which must be taken in sequence.
Prerequisite: Arch 360 .

## Arch 362 - Building Tectonics 3 (4)

A three-quartersequence introducing technologies involved in the design and construction of buildings. Topics include construction materials and methods, envelopedesign, mechanical systems, thermal, and other en vironmental building systems. This is the third course in a sequence of three: Arch 360 , Arch 361, and Arch 362 which must be taken in sequence.
Prerequisite: Arch 361.

## Arch 367U - Fundamentals of Environmental Design (4)

Basic concepts of climate and impacts on personal comfort. Thermal, lighting, and acoustical topics covered. Design approaches and concepts discussed fromlarge urban siting projects to individual buildings in order to minimize mechanical systems and reduce energy use. Alternative energy sources and building materials introduced.
Prerequisite: junior yearstanding.

## Arch 380 - Architectural Design Studio 1 (6)

Studio investigations of fundamental design concepts, is sues, and process. Projects and exercises focusing on the concepts of making three-dimensional forms -organization, proportion, scale, human activities, and introductory site and building design relationships. The release of the student's potential creative capabilities is a primary concern for the course. Includes individual criticism, lectures, and seminars. This is the first course in a sequence of three: Arch 380 , Arch 381, and Arch 382 and must be taken in sequence.
Prerequisite: Arch 281.

## Arch 381 - Architectural Design Studio 2 (6)

Studio investigations of fundamental design concepts, is sues, and process. Projects and exercises focusing on the concepts of making three-dimensional forms -organization, proportion, scale, human activities, and introductory site and building design relationships. The release of the student's potential creative capabilities is a primary concern for the course. Includes individual criticism, lectures, and seminars. This is the second course in a sequence of three: Arch 380, Arch 381, and Arch 382 and must be taken in sequence.
Prerequisite: Arch 380.

## Arch 382 - Architectural Design Studio 3 (6)

Studio investigations of fundamental design concepts, is sues, and process. Projects and exercises focusing on the concepts of making three-dimensional forms -org anization, proportion, scale, human activities, and introductory site and building design relationships. The release of the student's potential creative capabilities is a primary concern for the course. Includes individual criticism, lectures, and seminars. This is the third course in a sequence of three: Arch 380, Arch 381, and Arch 382 and must be taken in sequence.
Prerequisite: Arch 381.

## Arch 384 - Architectural Design Focus Studio I (3)

Studio investigations of architectural designs based on supporting human activities, structure and theory. Includes individual criticism, lectures and seminars.
Prerequisite: Arch 380.

## Arch 385 - Architectural Design Focus Studio II (3)

Studio investigations of architectural designs based on supporting human activities, structure and theory. Includes individual criticism, lectures and seminars.
Prerequisite: Arch 380.

## Arch 399 -Special Studies (0-12)

See department for course description. (Credit to be arranged.)

## Arch 401 - Research (0-12)

See department for course description. (Credit to be arranged.)

## Arch 404 - Cooperative Education/Internship (0-12)

See department for course description. (Credit to be arranged.)

## Arch 405 - Reading or Studio and Conference (0-12)

See department for course description. (Credit to be arranged.)

## Arch 406 -Special Projects (1-12)

(Credit to be arranged.)

## Arch 407 -Seminar (0-12)

See department for course description. (Credit to be arranged.)

## Arch 408 - Workshop(0-12)

See department for course description. (Credit to be arranged.)

## Arch 410 -Selected Topics (0-12)

See department for course description. (Credit to be arranged.)

## Arch 412 - Design/Build 1 (2)

Student-led design workshop focused on the design and production of construction-ready project documentation for small projects. The workshop is organized in the manner of a small practice with students and professors working collaboratively. The workshop is structured around material investigations, constructional studies, client meetings, consultant meetings, and the fabrication of fullscale mock-ups as themeans to understanding a fully realized project.

Also offered graduate-levelcredit as Arch 512 and may be taken only once for credit. Prerequisite: Arch 481 and permission of the instructor.

## Arch 413 - Design/Build 2 (4)

Elective course exploring design/build methodologies through the construction of a full-scale project meant for public engagement. Students will work collectively on investigations into on-site decision making, handling deviations fromconstruction documents, methods of construction, construction timelines and project management. This is the second part of a two-part design/build sequence that results in a hands-on, real-world project experience.
Also offered for graduate-level credit as Arch513 and may be taken only onceforcredit. Prerequisite: Upper-division standing.

## Arch 421 - Urban Design Methods (4)

Introduction to analytical and synthetic research methodologies inherent in the design of natural, architectural and urban contexts essential to contemporary urban design practice.

Also offered as graduate-leve credit as Arch 521 and may be taken only once for credit.

## Arch 423 - Advanced Architectural Graphics and Media (4)

Studio as signments exploring a full range of graphic representational techniques and media. Exploratory drawing and modeling work addressing the visualization of ideas in architecture, including: speculative thought and
concept formation; studies of light and shadow; exploration of color and texture.

Also offered for graduate-level credit as Arch 523 and may be taken only oncefor credit.

## Arch 425 - Computational Design \& Digital Making I (4)

Focuses on computational design softwares \& production workflows used in the architecture field. Arch 425 explores three dimensional methods for constructing, editing, visualizing and fabricating architectural ideas. This is the first course in a sequence of two: Arch 425 and Arch 426 which must be taken in sequence.
Also offered as graduate-level credit as Arch 525 and may be taken only once for credit. . Prerequisite: Arch 281.

Arch 426 - Computational Design \& Digital Making II (4)

Focuses on advanced topics in the computational design and digital production of architecture. Arch 426 continues study of digital methods of architectural design generation and development. Instructor sets software and topics of investigation (eg. parametric design, digital fabrication, physical computing). This is the second course in a sequence of two: Arch 425 and Arch 426 which must be taken in sequence.

Also offered as graduate-level credit as Arch 526 and may be taken only once for credit. . Prerequisite: Arch 425.

## Arch 430 - Architectural Theory (4)

Introduction to the content of theoretical propositions in architecture and their influence upon the directions, emphases and outcomes of creative making within an historical context.

Prerequisite: Arch 232.

## Arch 431 - Studies in Contemporary Urban Design (4)

Seminar course examining the contemporary relationships between the making of architecture and the making of cities. The course critically explores emerging urban characteristics, comparative design strategies, and the integration of design approaches with the processes of economic and social change.
Also offered for graduate-level credit as Arch 531 and may be taken only once for credit. . Prerequisite: Upperdivision standing.

## Arch 432 - History and Theory of Urban Design (4)

Introduction to the development of historical and contemporary urban design with paralleldevelopments in architecture and urban planning. Theoretical models are related to current practices in the design of various sociopolitical, environmental and aesthetic urban contexts.

Also offered for graduate-level credit as Arch 532 and may be taken only oncefor credit.

## Arch 433 - Contemporary Issues Seminar (4)

In-depthexploration of selected topics that explore contemporary is sues informing the discipline of architecture. Whether cultural, social, political, economic, aes thetic, environmental or other, contemporary is sues and voices contribute to the dynamic and evolving production, construction and inhabitation of architecture. Topics may include: visual art, literature, aesthetics, ethics, philosophy, politics, culture(s), and technology. Course may be repeated forcredit with different topics.
Also offered for graduate-level credit as Arch 533. Prerequisite: Upper-division standing.

## Arch 434 - Topics in Architectural History and Theory

 (4)Seminar on selected topics focusing on the history and theory of architecture. Consists of dis cussions, presentations, lectures, and readings on relevant topics as they have his torically emerged with in the discipline of architecture. May focus on specific his torical periods and/or may include philosophy of architecture, architectural representation, architecture and the city. Course may be repeated forcredit with different topics.
Also offered for graduate-level credit as Arch 534. .
Prerequisite: Upper-division standing.

## Arch 435 - Topics in Modernism (4)

Seminar investigating the influences and products of industrialized cultures as they relate to the discipline of architecture. Depending on the instructor, emphasis may be on the criticals tudy of cities, buildings, or landscapes, but each will be explored within the comprehensive understanding of the cultural and social conditions of Modernism. Coursemay be repeated forcredit with different topics.
Prerequisite: Upper-division standing.

## Arch 440 - Professional Practice (4)

A lecture course focusing on the context, res ponsibilities, licensure, principles and processes of the practice of architecture, including project and client acquisition, risk analys is, project and practice management, project delivery methods, services and scope definition, roles and res ponsibilities of all parties, contract forms, general conditions of the contract, compensation methods, fee budget management, contract administration, and standard of care.
Also offered for graduate-level credit as Arch540 and may be taken only oncefor credit. . Prerequisite: Upperdivision standing.

## Arch 441 - Practicum and Internship (4)

Offers students an opportunity to gain industry experience and to integrate the skills and concepts learned in the academic curriculum. Weekly seminars review and establish internship objectives, which closely parallel the architectural internship development programrequired for licensure. Students are expected to secure employment or positions that meet the objectives of the course.
Also offered for graduate-level credit as Arch 541 and may be taken only once for credit. . Prerequisite: Upper-dvision standing.

## Arch 442 - Building Economics (4)

Focuses on theeconomic and life cycle context of building design and management decisions. Topics include project life cycle, decision milestones, value analy sis of design and project proforma, dis counted cash flow and equivalency calculation methods, and conceptual estimating techniques for building projects. Strategic leveraging of project value is emphasized, and sustainability objectives are examined.
Also offered for graduate-level credit as Arch 542 and may be taken only once for credit. . Prerequisite: Arch 440 or Arch 540.

## Arch 460-Concepts in Building Technology (4)

Exploration of current advanced building technology and form generative responses to current sustainability is sues. Includes extensive investigation of current technologies for envelope, mechanical and thermal comfort systems, and lighting and day-lighting strategies. Strategies of formal integration with architectural design area emphasized.
Prerequisite: Arch 362.

## Arch 462 - Advanced Architectural Materials (4)

Seminar building on basic properties of architectural materials learned in Arch 360. A research-based course looking at creative use and reuse of materials for cons truction emphasizing sustainable solutions. Includes case study investigations of contemporary innovative material us age and student-designed building component.
Also offered for graduate-level credit as Arch 562 and may be taken only oncefor credit. . Prerequis ite: Arch 362.

## Arch 467 - Building Structures (4)

A lecture course that develops a basic understanding of structural elements and their implications for architectural form. Major topics include assembly, statics, properties of common structural materials, vertical and lateral load resisting systems. Precedent studies in vestigate structure in historical and contemporary buildings.
Prerequisite: Arch 362.

## Arch 480 - Architectural Design Studio 4 (6)

Studio investigations of architectural designs based on supporting human activities, structure, and theory. Continued study of design process and methods encompassing concepts of architecture, landscape architecture, and interior design. Includes individual criticis $m$, lectures, and seminars. This is the first coursein a sequence of three: Arch 480, Arch 481, and Arch 482 which must be taken in sequence.
Prerequisite: Arch 381 or Arch 382 and Arch 362.

## Arch 481 - Architectural Design Studio 5 (6)

Studio investigations of architectural designs based on supporting human activities, structure, and theory. Continued study of design process and methods encompassing concepts of architecture, landscape architecture, and interior design. Includes individual criticism, lectures, and seminars. This is the second course in a sequence of three: Arch 480, Arch 481, and Arch 482 and must be taken in sequence.

Prerequisite: Arch 480.

## Arch 482 - Architectural Design Studio 6 (6)

Studio investigations of architectural designs based on supporting human activities, structure, and theory. Continued study of design process and methods encompassing concepts of architecture, landscape architecture, and interior design. Includes individual criticism, lectures, and seminars. This is the third course in a sequence of three: Arch 480, Arch 481, and Arch 482 and must be taken in sequence.
Prerequisite: Arch 481.
Arch 501-Research (0-12)
See department for course description. (Credit to be arranged.)

## Arch 504-Cooperative Education/Internship (0-12)

See department for course description. (Credit to be arranged.)

## Arch 505-Reading or Studio and Conference (0-12)

See department for course description. (Credit to be arranged.)

## Arch 507 -Seminar (0-12)

See department for course description. (Credit to be arranged.)

## Arch 508 - Workshop (0-12)

See department for course description. (Credit to be arranged.)

## Arch 509-Practicum(1-9)

(Credit to be arranged.)

## Arch 510 -Selected Topics (0-12)

See department for course description. (Credit to be arranged.)

## Arch 511 - Pro-Thesis Seminar (4)

A research and discussion based course to identify, define and articulate specific cultural is sues and concerns that will become the inspiration for individual design thesis proposals. Students will generate the conceptual parameters and theoretical agenda of their proposed thesis, explore precedents and develop the programfor a significant urban intervention.
Prerequisite: Arch 582.

## Arch 512 -Design/Build 1 (2)

Student-led design workshop focused on the design and production of construction-ready project documentation for small projects. The workshop is organized in the manner of a small practice with students and professors working collaboratively. The workshop is structured around material investigations, constructional studies, client meetings, consultant meetings, and the fabrication of fullscale mock-ups as the means to understanding a fully realized project.

Also offered for undergraduate-level credit as Arch412 and may be taken only once for credit. Prerequisite: Permission of the in structor.

## Arch 513 - Design/Build 2 (4)

Elective course exploring design/build methodologies through the construction of a full-s cale project meant for public engagement. Students will work collectively on investigations intoon-site decision making, handling deviations fromconstruction documents, methods of construction, construction timelines and project management. This is the second part of a two-part design/build sequence that results in a hands-on, real-world project experience.

Also offered for undergraduate-level credit as Arch413 and may be taken only once for credit.

## Arch 521 - Urban Design Methods (4)

Introduction to analytical and synthetic research methodologies inherent in the design of natural, architectural and urban contexts essential to contemporary urban design practice.
Also offered as undergraduate-level credit as Arch 421 and may be taken only once for credit.
Arch 522 - Architectural Graphics and Media (4)
Studio introduction to a broad range of graphic representational techniques and media. Coursework develops skills in graphic visualization, representation and communication as used in architecture and related design fields. Concepts and conventions, fromfreehand to digital media, are used as a means to imagine, develop and represent design ideas

## Arch 523 - Advanced Architectural Graphics and Media (4)

Studio as signments exploring a full range of graphic representational techniques and media. Exploratory drawing and modeling work addressing the visualization of ideas in architecture, including: speculative thought and concept formation; studies of light and shadow; exploration of color and texture.

Also offered for undergraduate-levelcredit as Arch423 and may be taken only once for credit.

## Arch 525 - Computational Design \& Digital Making I

 (4)Focuses on computational design softwares \& production workflows used in the architecture field. Arch 525 explores three dimensionalmethods for constructing, editing, visualizing and fabricating architectural ideas. This is the first course in a sequence oftwo: Arch 525 and Arch 526 which must be taken in sequence. Also offered at undergraduate-level as Arch 425 and may be taken only once forcredit.

Also offered as undergraduate-level credit as Arch 425 and may be taken only once for credit.

## Arch 526-Computational Design \& Digital Making II (4)

Focuses on advanced topics in the computationaldesign and digital production of architecture. Arch 526 continues study of digital methods of architectural design generation and development. Instructor sets software and topics of investigation (eg. parametric design, digital fabrication, physical computing). This is the second course in a sequence of two: Arch 525 and Arch 526 which must be taken in sequence. Also offered at undergraduate-level as Arch 426 and may be taken only once for credit.

Also offered as undergraduate-level credit as Arch 426 and may be taken only once for credit.

## Arch 530-Contemporary Architectural Theory (4)

Seminar course investigating architectural theory and critical thought by examination of key texts and contemporary architectural works.
Prerequisite: Arch 580.

## Arch 531 -Studies in Contemporary Urban Design (4)

Seminar course examining the contemporary relationships between the making of architecture and the making of cities. The course critically explores emerging urban characteristics, comparative design strategies, and the integration of design approaches with the processes of economic and social change.
Also offered for undergraduate-level credit as Arch 431 and may be taken only once for credit. .

## Arch 532 - History and Theory of Urban Design (4)

Introduction to the development of his torical and contemporary urban design with paralleldevelopments in architecture and urban planning. Theoretical models are related to current practices in the design of various sociopolitical, environmental and aesthetic urban contexts.

Also offered for undergraduate-level credit as Arch 432 and may be taken only once for credit.

## Arch 533 - Contemporary Issues Seminar (4)

In-depth exploration of selected topics that explore contemporary is sues informing the discipline of architecture. Whether cultural, social, political, economic, aesthetic, environmental or other, contemporary is sues and voices contribute to the dynamic and evolving production, construction and inhabitation of architecture. Topics may include: visual art, literature, aesthetics, ethics, philosophy, politics, culture(s), and technology. Course may be repeated forcredit with different topics.
Also offered for undergraduate-level credit as Arch433.
Arch 534 - Topics in Architectural History and Theory (4)

Seminar on selected topics focusing on the history and theory of architecture. Consists of discussions, presentations, lectures, and readings on relev ant topics as they have historically emerged within the discipline of architecture. May focus on specific historical periods and/or may include philosophy of architecture, architectural representation, architecture and the city. Course may be repeated for credit with differenttopics.
Also offered for undergraduate-level credit as Arch 434.

## Arch 536 - Architectural History and Theory I (4)

An introduction to the history and theory of architecture. A discipline in its own right and a cultural manifestation among others, architecture is seen in the horizon of human action and history. The course consists of discussions, presentations, lectures, and readings on key topics. This is the first course in a sequence of four: Arch 536, Arch 537, Arch 538, Arch 539 and must be taken in sequence.

## Arch 537 - Architectural History and Theory II (4)

Seminar investigating the problemof modernity as it relates to the discipline of architecture stretching from the colonial to the industrial worlds. Emphasis placed on the critical study of cities, buildings, and landscapes, understood within the cultural and social conditions of modernity. This is the second course in a sequence of four: Arch 536, Arch 537, Arch 538, Arch 539 and must be taken in sequence.
Prerequisite: Arch 536.

## Arch 538 - Architectural History and Theory III (4)

Seminar investigating the history and theory of the practice of architecture around the globe and across time periods. The coursecritically explores the professions and practices that make and shape the built environment and highlights a discussion of buildings, contexts, clients and users. This is the third course in a sequence of four: Arch 536, Arch 537, Arch 538, Arch 539 and must be taken in sequence.

Prerequisite: Arch 537.

## Arch 539 - Architectural History and Theory IV (4)

Seminar investigating the problemof post-modernity as it relates to the discipline of architecture. The course understands post-modernity in a his torical horizon stretching across the globe. Emphasis placed on cities, buildings, and landscapes, each explored within the cultural and social conditions of post-modernity. This is the fourth course in a sequence of four: Arch 536, Arch 537, Arch 538, Arch 539 and must be taken in sequence.
Prerequisite: Arch 538.

## Arch 540 - Professional Practice (4)

A lecture course focusing on the context, responsibilities, licensure, principles and processes of the practice of architecture, including project and client acquisition, risk analys is, project and practice management, project delivery methods, services and scope definition, roles and responsibilities of all parties, contract forms, general conditions of the contract, compensation methods, fee budget management, contract administration, and standard of care.

Also offered for undergraduate-levelcredit Arch440 and may be taken only once for credit. . Prerequisite: Arch 581.

## Arch 541 - Practicum and Internship (4)

Offers students an opportunity to gain industry experience and to integrate the skills and concepts learned in the academic curriculum. Weekly seminars review and establish internship objectives, which closely parallel the architectural internship development programrequired for licensure. Students are expected to secure employment or positions that meet the objectives of the course.
Also offered for undergraduate-level credit as Arch441 and may be taken only once for credit.

## Arch 542 - Building Economics (4)

Focuses on theeconomic and life cycle context of building design and management decisions. Topics include project life cycle, decision milestones, value analysis of design and project proforma, dis counted cash flow and equivalency calculation methods, and conceptual es timating techniques for building projects. Strategic leveraging of project value is emphasized, and sustainability objectives are examined.

Also offered for undergraduate-level credit as Arch 442 and may be taken only once for credit. . Prerequisite: Arch 440 or Arch 540.

## Arch 543 - Topics in Professional Practice (4)

Focused investigation of key as pects of professional architectural practice through direct casestudy analysis, reflection and critical appraisal. Emphas is on understanding the application of professionally in spired principles and processes in contemporary architectural practice.
Prerequisite: Arch 540.

## Arch 560 - Advanced Architectural Technology (4)

A lecture and seminar course providing exploration of current advanced building technology and formgenerative responses to current sustainability is sues. Includes extensive classroom, as well as fieldwork, and laboratory investigation of current technologies for envelope, mechanical and thermal comfort systems, and lighting and day-lighting strategies. Strategies of formal integration with architectural design are emphasized.

## Arch 561 - Detail Design (4)

A companion course to the Design Thesis, developing the technological implications of the thesis proposition. Addresses the detailed application of technological knowhow in terms of materials, envelope, environmental control, tectonics and structural logic, with respect to a predetermined portion of the architectural project.
Prerequisite: Arch 511.

## Arch 562 - Advanced Architectural Materials (4)

Seminar building on basic properties of architectural materials learned in Arch 360. A research-based course looking at creative use and reuse of materials for construction emphasizing sustainable solutions. Includes case study investigations of contemporary innovative material usage and student-designed building component.

Also offered for undergraduate-level credit as Arch 462 and may be taken only once for credit. . Prerequisite: Arch 362 or graduate standing.

Arch 563 - Building Science Research Topics (4)
A workshop and seminar addressing the detailed application of passive strategies and building technology engaging key topics such as: building materials, envelope, en vironmental control, and structural systems. Utilizing contemporary building scienceresearch methods and practice. Course may be repeated for credit with different topics.

## Arch 564 - Architectural Technology III (4)

The third in a 3-part sequence introducing design and construction technologies. Exploration of the physical properties of materials, building assemblies, and methods of construction, leading to the integration of building envelope, mechanical, thermal, and other environmental building systems. The sequence Arch 568, Arch 569, Arch 564 must be taken in that order.
Prerequisite: Arch569.

## Arch 567 - Architectural Structures (4)

A workshop and seminar based course addressing the design and construction of large-scale structural systems. Investigates the innovative use of traditional and nontraditional building materials and structural detailing, exploring the potential of visually expres sive structural systems through a series of working models.

Prerequisite: Arch 362.

## Arch 568-Architectural Technology I (4)

The first in a 3 -part sequence introducing design and construction technologies. Exploration of the physical properties of materials, building assemblies, and methods of construction, leading to the integration of building envelope, mechanical, thermal, and other environmental building systems. The sequence Arch 568, Arch 569, Arch 564 must be taken in that order.

Prerequisite: graduatestanding.

## Arch 569 - Architectural Technology II (4)

The second in a 3 -part sequence introducing design and construction technologies. Exploration of the physical properties of materials, building assemblies, and methods
of construction, leading to the integration of building envelope, mechanical, thermal, and otherenvironmental building systems. The sequence Arch 568, Arch 569, Arch 564 must be taken in that order.
Prerequisite: Arch 560.

## Arch 570-Architectural Design Transition Studio I (6)

Transition studios developing architectural ideas, alongside media and technical skills necessary for advanced graduate study. Creative investigations of architectural design inspired by human activities, site, landscape, structure, tectonics, communal space and urbanism. Includes individual criticism, lectures and seminars. This is the first course in a sequence of three: Arch 570, Arch 571, and Arch 572 which must be taken in sequence.
Prerequisite:graduatestanding.

## Arch 571 - Architectural Design Transition Studio II (6)

Transition studios developing architectural ideas, alongside media and technical skills necessary for advanced graduate study. Creative investigations of architectural design inspired by human activities, site, land scape, structure, tectonics, communal space and urbanism. Includes individual criticis $m$, lectures and seminars. This is the second course in a sequence of three: Arch 570, Arch 571, and Arch 572 which must be taken in sequence.
Prerequisite: Arch 570.

## Arch 572 - Architectural Design Transition Studio III (6)

Transition studios developing architectural ideas, alongside media and technical skills necessary for advanced graduate study. Creative investigations of architectural design inspired by human activities, site, landscape, structure, tectonics, communal space and urbanism. Includes individual criticism, lectures and seminars. This is the third course in a sequence of three: Arch 570, Arch 571, and Arch 572 which must be taken in sequence.
Prerequis ite: Arch 571.

## Arch 573-Architectural Design Transition Studio IV (6)

Studio projects and critical dis cussions addressing themes and issues pertinent to the imaginative design of architectural intervention in urban environments. Encouraging experimental engagement with relations of material, form, human habitation, and cultural meaning.
Prerequisite: Arch 572.

## Arch 580 - Architectural DesignStudio 7 (6)

Advanced investigations of architectural and urban design is sues in concluding series of studios. Projects include the design of private and public buildings which require
comprehensive, integrative design development. Includes individual criticism, lectures, and seminars. This is the first course in a sequence of three: Arch 580, Arch 581, and Arch 582 which must be taken in sequence.
Prerequisite: Graduatestanding.

## Arch 581 - Architectural Design Studio 8 (6)

Advanced investigations of architectural and urban design is sues in concluding series of studios. Projects include the design of private and public buildings which require comprehensive, integrative design development. Includes individual criticism, lectures, and seminars. This is the second course in a sequence of three: Arch 580, Arch 581, and Arch 582 which must be taken in sequence.
Prerequisite: Arch 580.

## Arch 582 - Architectural Design Studio 9 (6)

Advanced investigations of architectural and urban design is sues in concluding series of studios. Projects include the design of private and public buildings which require comprehensive, integrative design development. Includes individual criticism, lectures, and seminars. This is the third course in a sequence of three: Arch 580, Arch 581, and Arch 582 which must be taken in sequence.

Prerequisite: Arch 581.

## Arch 584 - Design Development Studio (6)

A studio course offering intensivecreative study in laying the foundation for, and developing, an architectural design strategy and approach in preparation for the student generated thesis proposition (Arch 585). The class incorporates research, preliminary graphic and modeling work in idea generation, and critique.
Prerequisite: Arch 511.

## Arch 585 - Design Thesis (6)

A studio course offering a focused culmination of architectural design studies by means of a student generated thesis proposition incorporating research, development, and creative transformation of a specific urban situation.
Prerequisite: Arch 511, Arch 584.

## Arch 586 - Integrated Systems (6)

A companion course to Architectural Design Studio 9, this studio addresses the integration of building systems through detailed development of the design proposition begun in Arch 582 leading to a comprehensive design. Addresses application and technicaldocumentation of building systems including materials, envelope, environmental controls, building services, and structure.
Prerequisite: Arch 582.

## ArH - Art History

## ArH 106 - Introduction to Visual Literacy (2)

This course is intended to teach students to critically view and interpret global visual culture, fromancient to contemporary. Through critical analysis, reading, discussion, and writing, it seeks to develop the skills to engage with visual culture in ways that will empower them to participate fully in our visually -oriented contemporary society and provide them with a strong foundation for future courses in art history, art, and design.

## ArH 110 - Visual Literacy (4)

Course is intended to equip students with the necessary skills to critically view and interpret global visual culture, and to provide them with a strong foundation for future art courses in art history, art, and design, through critical analysis, reading, discussion, and writing.

## ArH 199 - Special Studies (0-12)

See department for course description. (Credit to be arranged.)

## ArH 204 - Art History: The Ancient World (4)

Survey of the major works of art and architecture from around the world, and an introduction to the analytical tools used by art his torians. This course investigates art and architecture from the prehis toric era, ancient Mediterranean cultures, Byzantium, the Islamic world, and early works from South and Southeast Asia, China and Korea. This is the first course in a sequence of three: ArH 204, ArH 205, and ArH 206. Open to non-majors.

## ArH 205 - Art History: The Medieval World (4)

Survey of the major works of art and architecture from around the world, and an introduction to the analytical tools used by art his torians. This course investigates art and architecture fromChina, Korea, Japan, Europe from the Medieval Through BaroquePeriods, Native American Cultures before 1500, and Africa before 1800. This is the second course in a sequence of three: ArH 204, ArH 205, and ArH206. Open to non-majors.

## ArH 206 - Art History: The Modern World (4)

Survey of the major works of art and architecture from around the world, and an introduction to the analytical tools used by art his torians. This course investigates Oceanic Art, later Asian art; African, European and North American Art from 1800 to the present, and later Native

American Art. This is the third course in a sequenceof three: ArH 204, ArH 205, and ArH 206. Open to nonmajors.

## ArH 291 - History of Animation (4)

Exploration of the history of animation, its sources in drawing, painting, photography, film, video, and digital media, its various innovators, styles, and techniques, its relationship with cinema, and its reliance on the development of creative and presentation technologies. Emphas is is placed on the theory and critical study of animation. Readings and dis cussion are combined with extensive screenings of animations and animated films, including the history of computer animation. Open to nonmajors.

## ArH 311U- Survey of South and Southeast Asian Art (4)

A survey of art and architecture of South and Southeast Asian art fromprehistoric times to the 19th century. The art and architecture (including ceramics, sculpture, painting) of As ia will be presented in context of chronology, source (indigenous or foreign influence), site and in relation to the forces of each society's culture, religion, politics, geography, and his tory. Buddhism, Hinduism, Is lamic architecture, painting, symbolism, and mythology are basic to the arts of A sia.

## ArH312U- Survey of Chinese Art (4)

A survey of art and architecture of China fromprehistoric times to the 21st-Century. The art and architecture, including ceramics, sculpture, painting, textiles, and other utilitarian implements (e.g., Chinese ritual bronze vessels) of China will be presented in context of chronology, source (indigenous or foreign influence), site and in relation to the forces of each society's culture, religion, politics, geography, and his tory. Shamanism, Confucianism, Taoism, Buddhism, Hinduism, symbolism, yin and yang philosophy, and my thology that are basic to the arts of China, the influence of central Asian art on Chinese art and Chinese influence on Korean art.

## ArH 313U- Survey of Japanese Art (4)

A survey of art and architecture of Japan from prehis toric times to the 21st century. The art and architecture (including archaeology, ceramics, sculpture, painting, textiles, and other utilitarian implements-- e.g., Samurai armors ) of Japan will be presented in context of chronology, source (indigenous or foreign influence), site and in relation to the forces of each period's culture, religion, politics, geography, and history. Shintoism,
mythology, Buddhism, Confucianism, are Taoism, are bas ic to the arts of Japan.

## ArH 315U - Chinese Buddhist Art (4)

A concentrated study of the Buddhist art of China and Central Asia. Buddhistart of caves of the Six-dynasties period (220-589 C.E.) to the Qing period will be covered in-depth. Basic concepts of Buddhism, such as Hinayana, Mahayana, and Tantric Buddhism; the Central Asian sources forChinese Buddhist art and archaeology, arts related to specific sects; and the iconography and stylistic changes will be covered.

## ArH 316U- Japanese Buddhist Art (4)

A survey of the Japanese Buddhist art and architecture, including: archaeology, sculpture, painting, Shingon Buddhistart, Zen garden and architecture, and ink paintings and Korean and Chinese sources through selected examples from the 6th century to the 18 th century.

## ArH317U- Chinese Painting (4)

A concentrated study of the Chinese painting fromthe 3rd century B.C.E. to the 21 st century.

## ArH 318U- Japanese Painting (4)

A survey of Japanese painting from the 4th century to the 20th century. Buddhist paintings, ink paintings, and decorative paintings and modern paintings.

## ArH319U- Modern Japanese Painting (4)

Recent scholarship in the his tory of modern Japanese paintings and prints, from the Meiji, Taisho, and Showa periods covers major themes of Japan's westernization in a new light. The is sues revolve around wes ternization: conflict and nationalis $m$. New art forms, the revival of traditional styles, the reclining woman theme, and the gaze of subjects will be explored. Contemporary Japanese Art will be covered with critical thinking.

## ArH 321U- Survey of Korean Art (4)

A chronological survey of art and architecture of Korea, and its uniqueness, in the context of East Asian art history. Prehistoric arts, as well as tomb paintings, and artifacts recognizing Buddhis m's effect on Korea's sculptural, painting, and architectural heritage. Also treats Confucianisms haping Korean ink painting, folk painting, and porcelains.

## ArH 329 - Islamic Art: Major Themes and Periods: (4)

Major themes in Is lamic Art and/or Architectural History. May be taught as a broad chronological survey or it may focus on a major period or topic (such as Ottoman art and/or architecture), considered in the global context. Expected preparation: ArH 204 (expected of art and art history majors). Open to non-majors.

## ArH 333U - Latin American Women Artists (4)

Focuses on modern women artists in the Latin American region, as well as the contributions of Latinx/Chicanx artists in the United States. Students will learn how Latin American women artis ts challenged traditional understandings of artistic practice, exploring and critiquing women's social roles in the process. Issues of race, class, gender, national/cultural/indigenous identity will be emphasized, linking these concepts to the visual and artistic projects of Latin American artists.

## ArH337U - Nature into Art (4)

Focuses on a s pecific theme concerning the relationship of the nature and theenvironment with the visual arts. Specific themes may include topics such as environmental art, lands cape painting and/or photography, landscape architecture, cartography and art, and the representation of animals. Recommended preparation: ArH 205 or ArH 206 (expected of art \& art history majors).

## ArH 351 U- Ancient Near Eastern and Egyptian Art (4)

Near Eastern art and architecture from the Neolithic Revolution to the conquestof Alexander the Great. Explores the beginnings of urbanization, the art and building of the pharaohs, and major empires such as the Assyrians and Sumerians. Recommended preparation: ArH 204 (expected of art \& art history majors).

## ArH 352U- Ancient Greek Art and Architecture (4)

Art in Greece from the Bronze age but focusing on developments from 1000-100 BCE. Topics include Minoan palaces, the development of the nude in sculpture, and the building programs and ideology of classical Athens. Recommended preparation: ArH 204 (expected of art \& art history majors).

## ArH353U-Ancient Roman and Etruscan Art and Architecture (4)

Art of Italy and the Roman W orld from 900 BCE- 400 CE. Topics include Etruscan funerary traditions, portraiture of the Roman Republic, and how the Roman Empire constructed identity through building and other public arts. Recommended preparation: ArH 204 (expected of art \& art history majors ).

## ArH 355U- Medieval Monsters (4)

Explores visual and literary medieval representations of monsters such as griffins, gargoyles, and unicorns to better understand key concepts about the "natural" world, definitions of monster now and in the past, the relationship between monsters in medieval texts and those in art, and "monsters" as constitutive of the medieval in the popular imagination.

## ArH 356U - Early Medieval Art and Architecture (4)

Explores the art and architecture of Early Christian, Insular, Viking, Carolingian, and early Is lamic world. Works covered include early Christian catacombs, the Book of Kells, and the so-called desert palaces of Umayyad caliphs in order to explore the themes of monasticism, pilgrimage, and the transmission of ideas around the Mediterranean. Recommended preparation: ArH204 (expected of art \& art his tory majors).

## ArH 357U- Byzantine Art and Architecture (4)

Art and architecture of the Byzantine world fromthe founding to the fall of Constantinople (330-1453 A.D.) Topics include art and politics under Justinian, Iconoclasm and Icons, and cultural interchange with neighboring Is lamic societies. Recommended preparation: ArH 204 (expected of art art history majors).

## ArH 358U - Medicine and Magic in Romanesque Art

 (4)Focuses on the ways medicine and magic can be viewed in the art and material cultures of the Romanesqueera as well as other medieval periods. We look critically at concepts such as magic and science in their historical context to better understand how medieval practices such as alchemy and as trology are represented in art including manuscripts, sculpture, amulets, and early printed books. Expected preparation: ArH 204 (expected of art \& art history majors).

## ArH 359U - Gothic Art and Architecture (4)

Gothic art and architecture across Europe fromthe 13th to the 16th centuries. Topics include the development of the cathedral, and the rise of the city, manuscript illumination, and artists such as Giotto and Duccio. Recommended preparation: ArH 205 (expected of art \& art history majors).

## ArH360U- The Art of War: Representing the Crusades (4)

This class investigates the representation of the Crusades in light of the primary sources from the period as well as later depictions. Students will analyze both his torical texts and more recent representations of the idea of the Crus ades, and study how vis ual culture plays a role in these polemics.

## ArH 361 U- Northern Renaissance Art (4)

Manuscript illumination, painting, and sculpture in the Netherlands, Germany, and France fromthe late 14th to the 16th century. Recommended preparation: ArH 205 (expected of art \& art history majors).

## ArH 371U- Italian Renaissance Art (4)

Painting, sculpture, and architecture fromthe 13th to the 16th century in Italy. This is the first course in a sequence of three: ArH 371U, ArH 372U, and ArH 373U.
Recommended preparation: ArH 205 (expected of art \& art history majors).

## ArH 372U- Italian Renaissance Art (4)

Painting, sculpture, and architecture fromthe 13th to the 16th century in Italy. This is the second course in a sequence of three: ArH 371U, ArH 372U, and ArH373U. Recommended preparation: ArH 205 (expected of art \& art history majors).

## ArH 373U- Italian Renaissance Art (4)

Painting, sculpture, and architecture fromthe 13th to the 16th century in Italy. This is the third course in a sequence of three: ArH 371U, ArH 372U, and ArH373U.
Recommended preparation: ArH 205 (expected of art \& art history majors).

Prerequisite: .

## ArH 376U- Italian Baroque Art (4)

A survey of major trends in Italian art and architecture from the late 16th to the mid-18th century. Open to nonmajors.

## ArH 377U- Dutch and Flemish Baroque Art (4)

A survey of major trends in Dutch and Flemish art from the late 16th to the late 17th century. Open to non-majors.

## ArH 378U- Spanish Baroque Art (4)

A survey of major trends in Spanish painting, sculpture, and architecture from the late 16th to the early 18thcentury. Open to non-majors.

## ArH 379U- Latin American Baroque Art (4)

Examination of the rich artistic tradition that developed in several Latin American countries during the Spanish colonial period (1492-1821). Emphasis on Mexico and Peru, where the Aztec and Incaempires were located. Survey of the major trends in Spanish colonial painting, sculpture, and architecture.

## ArH 381U- 19th Century Art (4)

A survey of painting and sculpture in 19th-century Europe and the U.S. This is the first course in a sequence of two: ArH381: Neoclas sicism, Romanticis m, and Realism; ArH 382: Impressionismand Post-Impressionism. Expected preparation: ArH 206 (expected of art and art history majors).

## ArH 382U- 19th Century Art (4)

A survey of painting and sculpture in 19th-century Europe and the U.S. This is the second course in a sequence of two: ArH 381: Neoclas sicism, Romanticism, and Realism, ArH 382: Impres sionis mand Post-Impressionism. Expected preparation: ArH 206 (expected of art and art history majors).

## ArH 383 - Western Art in the 20th Century (4)

A chronological survey of modern and postmodern art in Europe and the U.S. in the 20th century. This is the first course in a sequence of three: ArH 383: from Art Nouveau to Surrealis m; ArH 384: from American Scene Painting through the rebellious sixties; ArH385: from Conceptual art through the end of the century. Open to non-majors.

## ArH 384 - Western Art in the 20th Century (4)

A chronological survey of modern and postmodern art in Europe and the U.S. in the 20th century. This is the second course in a sequence of three: ArH 383: from Art Nouveau to Surrealism; ArH384: from American Scene Painting through the rebellious sixties; ArH 385 : from Conceptual art through the end of the century. Open to non-majors.

## ArH 385 - Western Art in the 20th Century (4)

A chronological survey of modern and postmodern art in Europe and the U.S. in the 20th century. This is the third course in a sequence of three: ArH 383: from Art Nouveau to Surrealism; ArH384: from American Scene Painting through the rebellious sixties; ArH 385: from Conceptual art through the end of the century. Open to non-majors.

## ArH 392 - History and Contemporary Issues in Photography (4)

The history of photography focusing on its exemplary masters, the impact of photographic technologies and techniques, contemporary is sues of aesthetics and ethics in photography, the role of photography in the fine arts and design, and emerging photographic media.

## ArH398-Contemporary Art (4)

Examines developments in world art in the 21st century. His torical roots of contemporary art will also be considered, e.g. the rise of identity politics, postcolonialism, and globalization. Clas s considers themes such as feminis $m$, postmodernism, activis $m$, and relational aes thetics, exemplified in artworks across all mediums. Open to non-majors.

Prerequisite: .

## ArH 399 - Special Studies (0-12)

Terms, section, instructor and hours to be arranged. Consent of instructor and Director of the School of Art and Design required.
Prerequisite: .

## ArH 401 - Research (0-12)

Terms, section, instructor and hours to be arranged. Consent of instructor and chair of the Department of Art required. (Credit to be arranged.)

## ArH 402 - Independent Study (1-12)

Terms, section, instructor and hours to be arranged. Consent of ins tructor and Chair of the Department of Art required.

## ArH 403 - Thesis (1-12)

(Credit to be arranged.)

## ArH 404 - Cooperative Education/Internship (0-12)

Terms, section, instructor and hours to be arranged. Consentof instructor and chair of the Department of Art required. (Credit to be arranged.)

## ArH 405 - Reading and Conference (0-12)

Terms, section, instructor and hours to be arranged. Consentof instructor and chair of the Department of Art required. (Credit to be arranged.)

## ArH 406 - Projects (1-12)

(Credit to be arranged.)

## ArH 407 - Seminar (0-12)

A small discussion-based class focused on developing research, critical thinking, and communication skills. Topic varies by term, see School for current seminar information.
Prerequisite: Art History major or permis sion of instructor.

## ArH 410 - Selected Topics (0-12)

See department for course description. (Credit to be arranged.)

## ArH 415U- Issues in Asian Art (4)

Is sues in Asian art may be keyed to museumexhibitions or deal with thematic topics or specific media. Examples include Buddhist or other religious art, tomb art, ceramics, special topics in Korean art, or the work of AsianAmerican artists. Open to non-majors.
Prerequisite: Upper-division standing.

## ArH 426U - African Art (4)

Examination of selected African art forms, styles, and traditions. Emphas is on thecontext of the art and artist and their relationship to politics and society in African history. This is the same course as BSt 470U and may be taken only once for credit. Open to non-majors.

Prerequisite: Upper-division standing. Cross-Listed as: BSt 470U.

## ArH 431U- Women in the Visual Arts (4)

This course studies both the representation of women and gender and the art and patronage by women in various media (painting, sculpture, architecture, printmaking, photography, textiles and mixed media). Explores 19th century and 20th century America andEurope. This is the same course as WS 431U and may be taken only once for credit. Open to non-majors. Recommended preparation: ArH 206 (expected of art \& art history majors).
Prerequisite: Upper-division standing. Cross-Listed as: WS 431U.

## ArH 432U - Issues in Gender and Art (4)

Research, reading, and discussion on sexual subjectivity and the construction of gender in visual images and various cultural contexts. May be keyed to regional exhibitions, collections, or symposia. Topics include: masculinity in ancient Rome, pornography and representation, surrealism, and sexuality. Open to nonmajors. Recommended preparation: ArH 206 and either ArH 204 or ArH 205 (expected of art \& art history majors).
Prerequisite: Upper-division standing.
ArH 449 - Art History Methods (4)
Seminar for juniors and seniors. Explores major approaches to the study of art his tory through readings, discussion, and essays. Includes the development of art history as a field and common methodologies such as iconography, gender theory, social art his tory, and postmodernis mand post-structuralism. Open to nonmajors.
Also offered for graduate-level credit as ArH 549 and may be taken only once for credit. . Prerequisite: At least three upper-division art his tory courses.

## ArH 450 - Great Periods and Themes in Art and Architecture (4)

A concentrated study of the art and/or architecture of a major historical period or theme, for example, PreColumbian art and architecture or Medieval Venetian Architecture. May be repeated for credit with different topics. Opento non-majors, Recommended preparation: $\mathrm{ArH} 204, \mathrm{ArH} 205$, or ArH 206 (expected of art \& art history majors).

Also offered for graduate-level credit as ArH 550. . Prerequisite: Upper-division standing.

## ArH 474 - Artand the Early Modern City (4)

Each iteration of this course explores the art, architecture, and urban development of a different renais sance or baroquecity. Contact instructor for details.
Prerequisite: ArH 205.

## ArH 486 - American Art and Architecture 17th through 19th Centuries (4)

ArH 486: Colonial through the Early Republic. ArH 487: Jacksonian to the 20th century. Open to non-majors. This is the first course in a sequenceof two: ArH 486 and ArH 487. Expected preparation: ArH 206 (expected of art \& art history majors).
Prerequisite: Upper-division standing.
ArH 487-American Art and Architecture 17th through 19th Centuries (4)
ArH 486: Colonial through the Early Republic. ArH 487: Jacksonian to the 20th century. Open to non-majors. This is the second course in a sequence of two: ArH 486 and ArH487. Recommended preparation: ArH 206 (expected of art \& art history majors).

Prerequisite:Upper-division standing.

## ArH 499 - Contemporary Art II (4)

A thematic examination of historicaldimensions of contemporary art practices in the 21st century. Explores themes, movements and trends as much as individual artists or works of art. Places art into a broadhistorical and socialcontext, and looks at cross-cultural and interdis ciplinary connections. Suggested preparation: ArH 491, ArH 492, ArH 493, and ArH 498.

Prerequisite: ArH 206 and upper-division standing.

## ArH 501 - Research (0-12)

Terms, section, instructor and hours to be arranged. Consentof ins tructor and chair of the Department of Art required. (Credit to be arranged.)

## ArH 503-Thesis (1-9)

(Credit to be arranged)

## ArH 504 - Cooperative Education/Internship (0-12)

Terms, section, instructor and hours to be arranged. Consentof instructor and chair of the Department of Art required. (Credit to be arranged.)

## ArH 505 - Reading and Conference (0-12)

Terms, section, instructor and hours to be arranged. Consentof instructor and chair of the Department of Art required. (Credit to be arranged.)

ArH 506 - Projects (1-9)
(Credit to be arranged.)

## ArH 507 - Seminar (0-12)

See department for course description. (Credit to be arranged.)

## ArH 510 - Selected Topics (0-12)

See department for course description. (Credit to be arranged.)

## ArH 549 - Art History Methods (4)

Seminar for juniors and seniors. Explores major approaches to the study of art his tory through readings, discussion, and essays. Includes the developmentof art history as a field and common methodologies such as iconography, gender theory, social art history, and postmodernis mand post-structuralis m. Open to nonmajors.
Also offered for undergraduate-level credit as ArH 449 and may be taken only once for credit. . Prerequisite: at least three prior upper division art history courses.

## ArH 550 - Great Periods and Themes in Art and Architecture (4)

A concentrated study of the art and/or architecture of a major historical period or theme, for example, PreColumbian art and architecture or Medieval Venetian Architecture. May be repeated for credit with different topics. Open to non-majors.
Also offered for undergraduate-levelcredit as ArH 450. . Prerequisite: graduate-level standing and permis sion of instructor.

## ArH 598 - Contemporary Art I (4)

Exploration of major developments in the art world from the late 20th century. Looks at origins of contemporary art, the transition fromModernismto Post-Modernism, important themes in contemporary art, and is sues facing the practicing artist of today, in the U.S. and globally.
Prerequisite: admission into the MFA in Contemporary Art Practice program.

## ArH 599 - Contemporary Art II (4)

A thematic examination of his torical dimensions of contemporary art practices in the 21st century. Explores themes, movements and trends as much as individual artists or works of art. Places art into a broad his torical and social context, and looking at cross-cultural and interdis ciplinary connections. Recommended preparation: ArH 591, ArH 592, ArH 593, ArH 598.
Prerequisite: admission into the MFA in Contemporary Art Practice program.

## Art - Art

## Art 101 - CORE: Surface (5)

Introduction to working with surface as a medium, concept, and process. The principles and elements of design will be explored in relation to the practices of twodimensional design and color theory. No prerequisites. Open to majors in the School of Art + Design

## Art 102 - CORE: Space (5)

Introduction to space as a medium, concept, and process. Lectures, readings, demonstrations and hands-on projects help students identify and understand space-based principles in art and design. No prerequisites. Open to majors in the Schoolof Art + Design.

## Art 103 - CORE: Time (5)

Introduction to working with Time as a medium, concept, and process. Within this, the principles of duration, intensity, and rhythmare particularly significant and frame narrative and storytelling development. This course involves lectures, readings, demonstrations and hands-on exercises that help students identify time-based principles in art and design. Individual and group projects support these concepts in practice. No prerequisites. Open to majors in the School of Art + Design.

## Art 104 - CORE: Digital Tools (2)

Introduces students to various digital tools, applications, and creative modes to share, dis tribute and produce art works. Students will expand their practice and understanding of how s martphone technologies, social media and online platforms can be used for creative outcomes. Students will learn to produce, assemble, manipulate and edit digital materials and to share those materials online and through print. This course includes lectures, readings, and activities. Students will build a learning community through discussions, collaborations, and field trips. Open to major or minors in School of Art + Design.

## Art 105-CORE: Ideation (2)

One of the biggestchallenges for creative people is taking an idea envisioned in the mind and turning it into reality. Ideation introduces students to techniques for bringing ideas to life. In this course, students will be introduced to a variety of techniques and concepts that focus on the generation, development and communication of new ideas. Open to major or minors in Schoolof Art + Design or with faculty permission.

## Art 131 - Introduction to Drawing I (4)

Introduction to observational, expres sive, and formal modes of drawing. Critical approaches drawn fromart history, aesthetics, and art criticis mare examined relative to these modes of drawing to establish methods of evaluating art and placing one's own work and that of others in a historical context. Emphas is on strategies, methods, and techniques for translating three-dimensional form and spaceonto a two-dimensional surface using the languageof line and value, and the illusion of depth and texture. Mark-making and its expres sive and descriptive qualities is examined. Open to non-majors.

## Art 199 -Special Studies (0-5)

(Credit to be arranged.)

## Art 216-Sewn Construction (4)

This is an introductory sewing course that covers the fundamentals of hand and machine sewing for garments and sewn products. Students gain a working knowledge of sewn construction for applications in costume, fashion, textiles, and contemporary art.

Prerequisite: Major or minor or in the School of Art + Design, or instructor approval.

## Art 227 - Introduction to Art and Social Practices (4)

Introduces an interdisciplinary approach to understanding and producing social practice art projects. Students will be encouraged to use a wide range of media and approaches in res ponding to various class assignments. Exploration of the PSU and Portland community will be an essential part of the class. The students will create work that responds to the dynamics of social spaces and public environments. Open to Non-majors. Recommended preparation: Art 105.

## Art 230 - Drawing II (4)

Continues to explore drawing as a means of personal expression with an emphasis on drawing fromobservation. Students deepen drawing strategies and continue to develop fluency in the language of line, shape, value, space, and color.
Prerequisite: Art 131.

## Art 250 - Life Drawing I (4)

Developing skills for drawing the human figure from observation in a variety of poses and media. This is the first of a sequence of three classes. Develops, skills in observation and perception. Later, analytic skills are combined with personalexpression and invention. A
variety of media is used to explore the implications of line and modeled formto explore the figure in compositional environments. The skeleton and mus cles will be studied in relationship to the model poses. Expected preparation for Art \& Art History Majors: Art 115 or Art 101, Art 102, Art 103, Art 104, and Art 105.

Prerequisite: Art 131.

## Art 255 - Two-dimensional Animation I (4)

Studio introduction to principles and processes of twodimensional animation composed in digital form. Storytelling and animation skills are developed in projects that apply tools and techniques for writing, staging, movement, timing, key framing, editing, and the use of sound and music. The language and aesthetics of animation are investigated through the design and production of a two-dimensional animation. Focus may be placed on either pixel or vector graphics. Project planning and workflow are explored in response to technical requirements for presenting the work in multiple media delivery formats.

## Art 256 - Three-dimensional Animation I (4)

Studio introduction to principles and processes of threedimensional modeling and animation composed in digital form. Projects apply tools and techniques for modeling, lighting, surface rendering, sceneconstruction, animation sequencing, editing, and the integration of sound and music. The language and aesthetics of animation and cinematography are investigated through the design and production of a three-dimensional animation. Project planning and workflow are explored in response to technical requirements for presenting the work in multiple media delivery formats. Expected preparation for Art \& Art History Majors: Art 101, Art 102, Art 103, Art 104, and Art 105.

## Art 257 - Introduction to Video Art (4)

Introduction to fundamental techniques of digital video production in the context of contemporary art practices. Topics cover a range of experimental and non-narrative forms, focusing on artists; use of video and other related media theory. Technical information covered includes cinematography, camera operations and digital video editing.

## Art 260 - Black and White Photography (4)

Studio introduction to black and white photography using both film-based darkroomand digital imaging techniques, including 35mm camera controls, film processing, enlargement, digital image capture, and basic digital image adjustment. Assignments focus on two dimensional design principles of line, shape, pattern, texture, symmetry,
as ymmetry, and vantage point, and culminate in a coherent photo story. While learning basic photographic techniques, students dis cuss form, content, and the aesthetics of photographic image-making. Studio includes lecture, demonstration, critique, and supervised lab work. Students must furnish a focusing film camera with adjustable f-stops and shutter speeds. Automatic cameras musthave manual override. Expected preparation for Art \& Art His tory Majors: Art 101, Art 102, Art 103, Art 104, and Art 105.

## Art 261 -Digital Photography (4)

Studio introduction to digital photography, exploring digital image capture, editing, and printing. Examination of the work of photographers with emphasis on conceptual development, the use of color, and digital craft, and mastery of bas ic digital camera controls. Course includes lectures, demonstrations, critique, and lab work. Students must provide own camera. Expected preparation for Art \& Art History Majors: Art 101, Art 102, Art 103, Art 104, and Art 105.

## Art 270 - Introduction to Printmaking: Relief (4)

A studio focused course concentrating on the planographic printmaking processes traditionally identified as "relief printmaking". This specialized technique will be presented utilizing the practice and concepts unique to historic, traditional/nontraditional and contemporary printmaking methodology. Monoprinting one of a kind image making and edition printing creating identical multiple images will be explored. Graphic languages developedthrough researching historical and contemporary influences will be presented to inspire and stimulate the students imagination and knowledge of graphic languages. Sequential thinking processes and theory will also be addressed. May be repeated twice for credit maximum 8 credits.

Prerequisite: Art 131.

## Art 271 - Introduction to Printmaking: Etching (4)

A studio focused course concentrating on the Etching technique of Printmaking. This specialized skill will introduce basic theories and concepts unique to historic, traditional/nontraditional and contemporary Printmaking. Monoprinting (one-of-a-kind image making) and edition printing will be explored. Creativity and playfulness are encouraged. Graphic languages developed through researching historical and contemporary influences will be presented to inspire and stimulate the students imagination and knowledge of contemporary graphic languages. Maximum 8 credits .

## Art 281 - Intro to Painting (4)

Course introduces basic principles of painting by exploring the use of color, form, composition and a variety of surface applications. Course assignments involve direct observational approaches presented through a variety of traditional and modern painting styles and techniques.

Prerequisite: Art 131.

## Art 282 - Painting Topics (4)

Introductory topics in painting based on various subjects of inquiry. Focusing on a specific material exploration and/or application, approaches will vary according to instructor.
Prerequisite: Art 131.

## Art 291 - Introduction to Sculpture (4)

Introduction to the basic fundamentals to sculpture. Students gain command of specific sculptural processes and materials while engaging in assignments that develop ideation and criticalthinking. Maximum 4 credits . Expected preparation for Art \& Art History Majors: Art 115 or Art 101, Art 102, Art 103, Art 104, and Art 105.
Prerequisite: Art 102.

## Art 292 - Introductory Sculpture Topics (4)

Introduction to specific topics in sculpture based on various subjects of inquiry. Focus on a specific theme, media, and/or process while eng aging in as signments that develop ideation and critical thinking. This course may be repeated for up to 12 credits with different topics. Expected preparation for Art \& Art History Majors: Art 115 or Art 101, Art 102, Art 103, Art 104, Art 105 and Art 131.
Prerequisite: Art 291.

## Art 294 - Water Media (4)

The techniques and uses of watercolor, gouache, and other water-based mediums with attention to unique characteristics as painting mediums. Collage and mixed media may be included with water-soluble pencils and crayons. Lectures on historic uses of these media and discussions of the aesthetic possibilities for layering and transparencies.

## Art 296 - Digital Drawing, Painting and Printmaking (4)

Studio course introducing concepts and processes in computer graphics through a set of defined problems examined through digital drawing, and painting applications. Projects explore a range of tools and techniques used in the digital paint environment, including the acquisition of imagery. The unique features of digital tools and techniques are investigated in terms of their relationships with traditional materials and processes. A critical and conceptual framework is developed for the
many uses of these tools in a fine art context through an emphasis on using the computer as an artist's tool and the inclusion of digital art forms and processes into the mixed media studio.

## Art 297 -Book Arts (4)

This mixed media class will explore the book as an art form. The relationship of images and/or words will be explored in relationship to narrative and sequential structures. Traditional and experimental methods of binding will be taught. Lectures on the history of the artist's book and is sues in imagery and/or ty pography will be presented. Class emphasizes an experimental and conceptual approach that integrates content and form. Maximum 8 credits.

## Art 299 -Special Studies (0-6)

(Credit to be arranged.)

## Art 301 -Processes andPractices of the Creative Industries (4)

This course provides an overview of creative industries, its practices, production, and consumption, and its importance to global knowledge-based economies. Students are introduced to key creative industries theoretical and analytical frameworks and will learn how these frameworks converge and can be applied in creative industries, as well as the importance of multidisciplinary collaborations to creative industries. Students will gain the foundational vocabulary and skills to critique, present and discuss creative industries ideas and case studies.

## Art 303-Making and Meaning (4)

Explores the relationship of material, method and process in the construction of meaning in art. Students experiment with interdisciplinary research methods to generate projects reflecting current topics of interest. Required for all BFA Art Practice majors.
Prerequisite: ART 105 or instructor approval.

## Art 312 - Art in the Elementary School (4)

Designed to give theelementary educator knowledge, skills, methodologies and resources that encourage the incorporation of art education as a regular, ongoing and sequential part of the core curriculum. Based on contemporary theory and practice focused exclusively on the teaching of art at $\mathrm{k}-5$ levels. This course is required for all students seeking a general multi-subject teaching license at the elementary level. Generalobjectives include establishing a theoretical and methodological found ation
that enables the student to teach age appropriate art les sons that engage children not only in art production activities but also to address the areas of art history, criticismand aesthetics. Open to Non-majors. Maximum 4 credits.

## Art 313-Textile Design (4)

Intended for upper-division students wanting to incorporated 2D textile materials and processes into their established creative practice. Students gain exposure to sourcing and manipulating experience textiles through a combination of hand and digital processes - including immersion dyeing, fabric painting, screen-printing, resist techniques, and digital fabric printing. Students develop projects around the skills learned that intersect with goals for their individual practices.

Prerequisite: Art Practice major or minor, or instructor consent.

## Art 316 - Fabric \& Form (4)

Covers sculptural approaches to using textiles for studio art and design practices. Students will learn the fundamentals of flat patterning and sewn construction for 3D form, wearables, and installation. Students will learn techniques for manipulating commercial patterns, adding structure to fabric and pliable material, and advanced methods of machine sewing. Lectures and readings expose students to the his tory of fiber, the use of textiles in contemporary art, and applications in fashion and costume.

Prerequis ite: Art 216 or instructor consent. The course is restricted to Art Practice Majors/Minors.

## Art 318 - Weaving: Pattern \& Structure (4)

An introduction to the conceptual and technical as pects of weaving. Students will be introduced to hand-weaving on a floor loom and tapestry looms as a way to understand basic woven structures and how to utilize weaving to create color, pattern, and texture. Students will be assigned a series of samples and projects that incorporatedyeing and hand-manipulated techniques in addition to basic structures. Demonstrations, lectures, readings, and critiques will incorporate historic and contemporary textiles to provide a basic understanding of the possibilities of weaving in a fine art context. This course may be taken for credit twice.
Prerequisite: Art 216 or instructor approval.

## Art 322U- History of Dress I (4)

Throughout humanhistory, dress and adornment have been vehicles for communicating both individual and collective identities. This course examines clothing and its context from Prehistory - 1900.

Prerequisite: Upper-division standing. Cross-Listed as: This is the same course as TA 322 U and may be taken only once forcredit.

## Art 323U- History of Dress II (4)

Throughouthumanhistory, dress and adornment have been vehicles for communicating both individual and collective identities. This course examines clothing and its context from 1900 to the present.
Prerequisite: Upper-division standing. Cross-Listed as: This is the same course as TA 323 U and may be taken only once forcredit.

## Art 327 - Intermediate Art and Social Practices (4)

Students will choose a department on campus other than the art department and will become "artists in residence" for that dept during the quarter. They will work with people in their selected departments to create projects that respond to the department's qualities, needs and interests. Students will document their process and projects, and will be graded on engagement in class and with their departments, journals, and projects. Recommended that it be taken in sequence. Open to non-majors. Recommended preparation: Art 227.

## Art 328 - KSMoCA: Museum in a Public School (4)

Students meet outside of the PSU campus at Dr. MLK Jr School in NE Portland where they contribute to the operation of the King SchoolMuseum of Contemporary Art, a contemporary art museuminside a functioning K-5 public school. The students work collaboratively in teams to research the surrounding neighborhood and prepare presentations/zines about an artistexhibiting at KSMoCA. Students work as mentors with elementary students, and they help to install a museumexhibition. This course is repeatable for up to 8 credits.

## Art 330 - Critical Theories in Art I (4)

After a brief look at art of the 1960s and 1970s, this class will explore major theoretical and philosophical developments in the art world over the last quarter-century. Various themes and forms of art and individual artists will be examined as manifestations of specific theories and philosophies that have emerged during the past 25 years. Particular emphas is will be on art of the post-9/11 era. Material will be covered through readings, slide lectures and films as well as frequent visits to the Portland Art Museum; we will also take advantage of gallery shows, lectures and other relevant local events. Assignments will include criticalresponse and research papers, group presentations.
Prerequisite: ArH 206.

## Art 331 - Art and Privilege (4)

Examines identity (personal, social, cultural) and privilege as they pertain to visual and socially engaged arts practices. Explores the definition(s) and impact of privilege from cultural, historical, racial, institutional, and economic pers pectives via readings, films, discussions/debates, visits, and projects. Focuses on contemporary perspectives.

## Art 336 - BFA: Research and Proposal (4)

Required third year seminar course offered spring termfor accepted BFA students. Introduction to both contemporary research methodologies and final project proposal development. Emphasis is placed on developing a body of work and preparing proposals for the final year BFA Project.
Prerequisite: Art 339 or instructor consent.

## Art 339-BFA Vertical Lab I: Collaboration and Presentation Strategies (4)

First of a two-termsequence that introduces artis ts' research methods and explores a range of strategies and platforms for presenting art work in public settings. Students collaborate on theme-based projects that culminate in public presentations. Coursework includes lectures, demonstrations, studio production and field trips. Required for BFA.

Prerequisite: Art 303 (concurrent enrollment allowed).

## Art 350 - Life Drawing II (4)

This is the second class in the Life Drawing sequence. The course continues development of skills in drawing the human figure in a variety of poses working with a variety of materials with an emphas is on the muscular system. The student should be able to state the figure quickly, economically and in proportion.
Prerequisite: Art 250.

## Art 355 - Video Installation (4)

Focuses on thecreation of artworks that combine video technology with three-dimensionalelements such as sculpture, projection, performance, sound, and site-specific installation. Students will study historical and contemporary examples of video installation and create their own works of video installation art.

Prerequisite: Art 257 or permis sion of instructor.

## Art 356 - Visual Storytelling (4)

Studio course exploring strategies of representation of stories, characters, and other narrative elements in timebased visual media. Focuses on the use and creation of storyboards, graphic novels, and animation in fiction and non-fiction storytelling. Expected preparation: Art 255, Art

256, and/or Art 257. Open to Non-majors with instructor's consent.

## Art 357 -Intermediate Video (4)

Studio course covering intermediate video production skills such as audio recording and sound editing, image compositing, and other relevant technical topics. Includes the study of current trends and theories in video art and experimental media to inform individual creative projects. Recommended preparation: Art 103 \& Art 257 (expected of art \& art history majors). Open to Non-majors with instructor's consent.
Prerequisite: Art 257.

## Art 358 - Video, Design \& Community (4)

Focus on collaboration in video production and community-based media. Production of a promotional/informational video for community org anizations in Portland. History of community and independent media. Basic video and audio recording, postproduction, interviewing, and group decision-making skills.
Cross-Listed as: This is the same course as Des 358 and may be taken only once for credit.

## Art 360 -Special Topics in Photography (4)

A variety of photographically based practices presented through lectures, demonstrations, and assignments. Students explore technical, aesthetic, and ethical is sues while developing photographic portfolios, with an emphasis placed on series, sequence and narrative.
Prerequisite: Art 260 and Art 261.

## Art 362 - Intermediate Photography (4)

Studio introduction to concepts, techniques, practices, aes thetics, and ethics of photographic imaging and imagemaking with digital technology. Investigations in photographic media are enabled through a variety of digital imaging techniques, including retouching, color correction, filtering, masking, layering, and compositing.

## Art 365 -Digital Portfolios for Visual Artists (4)

Studio course for visual artis ts focusing on design and development of digital portfolios. Concepts of portfolio development, graphic design, and interactive design are applied to create an effective communication of the artist's body of work. Digital production techniques are practiced as portfolios are as sembled and published in a variety of print, time-based, and interactive formats.
Prerequisite: upper-division standing.

## Art 370 - Topics in Printmaking Techniques (4)

Adding on to the principles and skill sets first investigated in lower-level printmaking this course explores additional techniques in printmaking. Varying practices, methodologies, and theories will be explored. Topics include but are not limited to etching, relief, mixed media print, screen printing, and mono-print. May be repeated for credit up to a maximum of 12 credits. Open to non-majors with instructors consent.
Prerequisite: Art 270 or Art 271.

## Art 371 - Intermediate Printmaking (4)

Through the techniques of fine art printmaking, students challenge themselves to think creatively and conceptually to develop a varied but cohesive print portfolio that explores a central theme. Students will support their creative expression with research and historical reference. This course is repeatable for up to 12 credits.
Prerequisite: Art 270 or Art 271 or Art 370.

## Art 373 - Intermediate Sculpture (4)

Intermediate-level course. Students work in a variety of media with a focus on contemporary sculptural practices. Assignments emphasize ideation and critical thinking in preparation for developing an independent, cohesive body of work. Maximum 4 credits.
Prerequisite: Art 291 or consent of instructor.
Art 374 - Intermediate Sculpture Topics (4)
Intermediate-level topics in sculpture based on various subjects of inquiry. Focus on a specific theme, media, and/or process. Assignments emphasize ideation and critical thinking in preparation for developing an independent, cohesive body of work.

Prerequisite: Art 373 or consent of instructor.

## Art 391 - Intermediate Drawing and Mixed Media (4)

Develops drawing and compositional strategies, languages and methods that build on skills learned in foundation courses. Students explore his torical and contemporary strategies of visual analysis, surface and space as tools for creative exploration.
Prerequisite: Art 230.

## Art 392 - Painting (4)

Using traditional and contemporary technical processes and conceptual approaches, students start developing a pers onal vocabulary with emphasis on the relationship of form and content, while investigating a variety of ways of researching and applying methods to wards developing a body of work.
Prerequisite: Art 281.

## Art 393 -Painting Topics (4)

Intermediate level special topics in painting based on various subjects of inquiry. Focusing on a specific theme, material explorations and applications, and/or specific content, approaches will vary according to instructor.
Prerequisite: Art 281.

## Art 399 -Special Studies (0-8)

Terms, section, instructor and hours to be arranged. Consent of ins tructor and Chair of the Department of Art required.

## Art 401 - Research (1-8)

(Credit to be arranged.) Terms, section, ins tructor and hours to be arranged. Consent of instructor and chair of the Department of Art required.

## Art 402 - Independent Study (1-6)

Terms, section, instructor and hours to be arranged. Consent of ins tructor and Chair of the Department of Art Required.

## Art 403 - Thesis (1-12)

(Credit to be arranged.)

## Art 404 - Cooperative Education/Internship (1-12)

(Credit to be arranged.) Terms, section, instructor and hours to be arranged. Consent of instructor and chair of the Department of Art required.

## Art 405 - Reading or Studioand Conference (1-9)

(Credit to be arranged.) Terms, section, instructor and hours to be arranged. Consent of instructor and chair of the Department of Art required.

## Art 406 -Projects (1-8)

(Credit to be arranged.) Terms, section, ins tructor and hours to be arranged. Consent of instructor and chair of the Department of Art required.

## Art 407 -Seminar (1-6)

(Credit to be arranged.) Terms, section, instructor, and hours to be arranged. Consent of instructor and chair of Department of Art required.

## Art 408-Workshop(1-6)

(Credit to be Arranged.) Terms, section, instructor and hours to be arranged. Consent of instructor and chair of the Department of Art required.

## Art 409-Practicum(1-12)

(Credit to be arranged.)

## Art 410-SelectedTopics (1-12)

(Credit to be arranged.) Maximum: 12 credits in one area.
Prerequisite: consent of ins tructor and chair of Department of Art.

## Art 416 - Textile Arts Studio (4)

Advanced studio course focusing on applications of textile arts including apparel and textile design, costuming, installation, sculptural fiber, and material studies. Also focuses on conceptual development, research, and production towards a cohesive body of work that reflect the individual intentions with textile processes.
Prerequisite: Art 316 or Instructor Approval.

## Art 427 - Advanced Artand Social Practices (4)

Students work outside of the PSU campus. The class will select a particular area of Portland, or a specific institution like a high school or senior center. The students will then become "artists-in-residence" in that area or institution. The students will keep journals documenting information presented in the class, personal projectideas. General class engagement and journal writing will form the bas is for grades. Open to non-majors.

Prerequisite: Art 227 or Art 327 or consent of instructor.

## Art 428 - KSMoCA: Museum and Community (4)

Students meet outside of the PSU campus at Dr. MLK Jr School in NE Portland to think critically about museums, education, site-specificity, and social topics. Students contribute to the operation of the King School Museumof Contemporary Art, and they lead reading discussions pertaining to topics associated with the museum, mentor elementary students, and help to install a museum exhibition. Collaboration, research, and participation are crucial elements of the course. This course is repeatable for up to 8 credits.

Also offered for graduate-level credit as Art 528.
Prerequisite: Art 227, Art 327, Art 328, or permission of the instructor.

## Art 430 - Critical Art Theories II (4)

Artwork and artists of the 21st century are examined with in the context of contemporary art theory. A thematic rather than a chronological approach will be used when examining theoretical, philosophical and socio-cultural aspects. Material will be presented through in-class instruction and field trips.

Also offered for graduate-level credit as Art 530 and may be taken only once forcredit. Prerequisite: Art 330.

## Art 439 - BFA Vertical Lab II: Collaboration and Presentation Strategies (4)

Second of a two-terms equence that introduces research methods, strategies and project management skills for publicly presenting artwork. Students collaborateon theme-based projects that culminate in public dis play. Coursework includes lectures, demonstrations, studio production and field trips. Required for BFA.
Prerequisite: Art 336.

## Art 450 -Life Drawing III (4)

The third course in the life drawing sequence. If students have had the preparation of prior classes in learning to draw the figure accurately fromobservation and have learned a little about basic anatomy then they will continue to develop skills in drawing the human figure in a variety of poses with the addition of compositions dealing with two or more figures when possible. Emphasis on compositional and expressive means Use of variety of materials. Recommended that it be taken in sequence. Open to non-majors with instructor's consent.
Prerequisite: Art 350.

## Art 455 - Time-Based Art Studio (4)

Advanced studio course focused on production of timebased arts including video art, animation, sound, performance, experimental film, installation, and other interd is ciplinary forms. Course content focuses on the representation of time in art.

Prerequisite: Art 255 and Art 257 or consent of instructor.

## Art 457 -Low Tech Cinema (4)

This studio course uses readily accessible technologies and inexpensive techniques to create media art work. Course topics include cell phones and mobile devices, conceptual and text-based movies, handmade 16 mm film techniques, toy cameras, diary videos, consumer-grade analog video equipment including VHS, glitch art, media appropriation, and hacking.
Also offered for graduate credit as Art 557 and may be taken only once for credit. . Prerequisite: Upper-division standing.

## Art 461 - Advanced Photography Studio (4)

An advanced studio course focused on the study of photographic practices and portfolio development. Students engage in discussion regarding assigned readings, practices within contemporary photography, and the critique of their own work. This course allo ws for a variety of photographic methods. This course is repeatable.

Also offered for graduate-level credit as Art 561. . Prerequisite: Art 360 or Art 362.

## Art 462 - Professional Practices in Photography (4)

Introduces senior and graduate students to the photography profession in its diverseforms and the commercial operation of photographic studios. Projects investigate one or more specialized forms of photographic practice, such as product, architectural, portrait, landscape, photoillus tration, or immersive photography. Specialized techniques in lighting and digital imaging may be explored.

Also offered for graduate-level credit as Art 562 and may be taken only once for credit. . Prerequisite: Art 360.

## Art 479 - Advanced Printmaking - Working Place (4)

An advanced laboratory course for students in the BFA Program. The intention of this course is to explore and experiment with several print techniques to arrive at a cohesive body of work that speaks to a students' individual vision. Maximum 12 credits. Open to non-majors who have prerequisites and instructor's consent.

Prerequisite: Art 370 or Art 371.

## Art 485 - Professional Practices for Artists (2)

This seminarexplores is sues of professional development for artists. Senior level art majors will be exposed to information that will aid themin the transition from student to professional. Intended for Art Practices majors only. Maximum 4 credits.
Prerequisite: Upper-division standing in Art Practices.

## Art 490 - Advanced Painting (4)

Through guided individual assis tance, this course concentrates on working methods of research and execution towards a specifically proposed project. Research, idea generation and production are emphasized within the context of a body of work, related to contemporary painting practices and theories.
Also offered for graduate-level credit as Art 590 and may be taken only once for credit. . Prerequisite: Art 392.

## Art 491 - Advanced Painting Topics (4)

Advanced level special topics in painting based on various subjects of inquiry. Focusing on a specific theme, material explorations and applications, and/or specific content,
approaches will vary according to instructor. The course should include subtitles highlighting the selected topic.

Also offered for graduate-level credit as Art 591 and may be taken only onceforcredit. .Prerequisite: Art 490 or MFA/graduate status or ins tructor's consent.

## Art 493 - Advanced Drawing Mixed Media (4)

This class represents the culminating experience in drawing and mixed media. Students are expected to develop a unified body of work that reflects and is informed by art his tory and contemporary theory. Open to non-majors who have prerequisites and consent of the instructor.
Also offered for graduate-level credit as Art 593 and may be taken only once for credit. Maximum 8 credits. . Prerequisite: Art 391.

## Art 494 - Advanced Sculpture (4)

Advanced-level sculpture course which focuses on conceptual development, research, and production as an advanced level sculpture student. Students develop an independent, cohesive body of work within a his torical and theoretical context. Maximum 4 credits .
Also offered for graduate-level credit as Art 594 and may be taken only once for credit. .Prerequisite: Art 373 and Art 374 or instructor's consent.

## Art 495 - Advanced Sculpture Topics (4)

Advanced-level topics in sculpture based on various subjects of inquiry. Focus on a specific theme, media, and/or process. Students develop an independent, cohesive body of work within a historical and theoretical context. Maximum: 8 credits.

Also offered for graduate-level credit as Art 595 and may be taken only onceforcredit. .Prerequisite: Art 494 or consent of instructor.

## Art 496 - BFA Project I (4)

Studio production andexhibition preparation in which students produce a body of work for a culminating presentation. Focus on studio production, research, editing, documentation, publication/catalog design and written statements. This is the first course in a sequence of two: Art 496 and Art 498 and must be taken in sequence. Required for all BFA students.
Prerequisite: Art 439.

## Art 497 - A History of Art and Social Practice (4)

A history of social practice in art. Investigate the current critiques, debates and is sues surrounding its current state in relation to its historical context. The course will examine social practice from 1920 to present and touch on the key movements. Willplace a strong emphasis on contemporary examples of social practice art through readings,
assignments, and online participation. This course will give a historic and critical context for social art. Open to nonmajors.
Also offered for graduate-level credit as Art 597 and may be taken only once for credit. . Prerequisite: Upperdivision standing.

## Art 498 -BFA Project II (4)

Second in a sequence of two directed study courses in studio production and exhibition preparation in which students complete and select work for a culminating Project Exhibition. Course will focus on completing projects, work selection, exhibition preparation and installation of Project. This is the second course in a sequence of two: Art 496 and Art 498 and must be taken in sequence. Required for all BFA students.

Prerequisite: Art 496. Corequisite: Art 499.

## Art 499 - BFA Oral Review (2)

Course prepares BFA students for the final oral review of their individual culminating projects. Format includes individual research, group critique, practice presentations, written reflections and final formal faculty-reviewed student presentations. Required for all BFA students. Corequisite: Art 498.

Prerequis ite: Art 336 and Art 496. Corequis ite: Art 498.

## Art 501 - Research (1-9)

(Credit to be arranged.) Terms, section, instructor and hours to be arranged. Consent of instructor and chair of the Department of Art required.

## Art 502 - Independent Study (1-6)

Terms, section, instructor and hours to be arranged. Consentof instructor and Chair of the Department of Art Required.

## Art 503-Thesis (1-9)

(Credit to be arranged.)

## Art 504 - Cooperative Education/Internship (1-9)

(Credit to be arranged.) Terms, section, instructor and hours to be arranged. Consent of instructor and chair of the Department of Art required.

## Art 505 - Reading or Studio and Conference (1-9)

(Credit to be arranged.) Terms, section, ins tructor and hours to be arranged. Consent of instructor and chair of the Department of Art required.

## Art 506 -Projects (1-8)

(Credit to be arranged.) Terms, section, ins tructor and hours to be arranged. Consent of instructor and chair of the Department of Art required.

## Art 507 -Seminar (1-6)

(Credit to be arranged.) Terms, section, instructor, and hours to be arranged. Consent of instructor and chair of Department of Art required.

## Art 508-Workshop(1-6)

(Credit to be Arranged.) Terms, section, instructor and hours to be arranged. Consent of instructor and chair of the Department of Art required.

## Art 510 -Selected Topics (1-8)

(Credit to be arranged.) Maximum: 12 credits in one area.
Prerequisite: consent of instructor and chair of Department of Art.

## Art 514 - Art Methods For Secondary School Teachers (4)

Methods and materials for teaching and coordination of art programs in grades 5-12, with an emphasis on organizing historical, aesthetic, critical and studiodemonstrations, lectures, and clas sroom/model presentations. Translating theory(ies) into practice(s) will be a continuing and ongoing focus of the clas ses in les sons, research and readings. Students will develop Art lessons and programs that reflect current state and national standards. Art 514 is an introduction to thehis tory of Art Education, the methods of instruction, philosophy of art education, and organization of art materials and tools. Art 515 explores the current best practices and is sues in Art Education, technology (media-computer) application to art, continuing research/issues in art education, Practical and contemporary is sues in public/private education. This is the first course in a sequence of two: Art 514 and Art 515. Open to non-majors with instructor's consent.

Prerequisite: Admission into the ArtEducation GTEP program.

## Art 515 - Art Methods For Secondary School Teachers (4)

Methods and materials for teaching and coordination of art programs in grades 5-12, with an emphasis on organizing historical, aesthetic, critical and studio demonstrations, lectures, and clas sroom/model presentations. Translating theory(ies) into practice(s) will be a continuing and
ongoing focus of the clas ses in les sons, research and readings. Students will develop Art lessons and programs that reflect current state and national standards. Art 514 is an introduction to the his tory of Art Education, the methods of instruction, philosophy of art education, and organization of art materials and tools. Art 515 explores the current best practices and is sues in Art Education, technology (media-computer) application to art, continuing research/issues in art education, Practical and contemporary is sues in public/private education. This is the second course in a sequence of two: Art 514 and Art 515. Open to non-majors with instructor's consent.

Prerequisite: Admis sion into the ArtEducation GTEP programand Art 514.

## Art 528 - KSMoCA: Museum and Community (4)

Students meet outside of the PSU campus at Dr. MLK Jr School in NE Portland to think critically about museums, education, site-specificity, and social topics. Students contribute to the operation of the King School Museumof Contemporary Art, and they lead reading discussions pertaining to topics associated with the museum, mentor elementary students, and help to install a museum exhibition. Collaboration, research, and participation are crucial elements of the course. This course is repeatable for up to 8 credits.
Also offered for undergraduate-level credit as Art 428.

## Art 530-Critical Art Theories II (4)

Artwork and artists of the 21 st century are examined with in the context of contemporary art theory. A thematic rather than a chronological approach will be used when examining theoretical, philosophical and socio-cultural as pects. Material will be presented through in-clas s instruction and field trips.
Also offered for undergraduate-level credit as Art 430 and may be taken only once for credit. Prerequisite: Admis sion into the MFA in Contemporary Art Practice program.

## Art 557 - Low Tech Cinema (4)

This studio course uses readily accessible technologies and inexpensive techniques to create media artwork. Course topics include cellphones and mobile devices, conceptual and text-based movies, handmade 16 mm film techniques, toy cameras, diary videos, consumer-grade analog video equipment including VHS, glitch art, media appropriation, and hacking.

Also offered for undergraduate credit as Art 457 and may be taken only once for credit.

## Art 561 - Advanced Photography Studio (4)

An advanced studio course focused on the study of photographic practices and portfolio development. Students engage in discussion regarding assigned readings, practices within contemporary photography, and the
critique of their own work. This course allows for a variety of photographic methods. Graduate students are required to complete an additional research project. This course is repeatable.
Also offered for undergraduate-levelcredit as Art 461.
Art 562 - Professional Practices in Photography (4)
Introduces senior and graduate students to the photography profession in its diverseforms and the commercial operation of photographic studios. Projects investigateone or more specialized forms of photographic practice, such as product, architectural, portrait, landscape, photoillus tration, or immersive photography. Specialized techniques in lighting and digital imaging may be explored.

Also offered for undergraduate-level credit as Art 462 and may be taken only once for credit. . Prerequisite: Graduatelevel standing and instructor's consent.

## Art 578 -Studio Practice: Workshop (2)

This course is a co-requisite to Art 580 Studio Practice: Directed Studies. In this workshop the focus will be on group dialogue and peer critique of individual and collaborative work with an emphasis on the relationship between research, production and presentation. In addition to requiring that students experiment with new methods, materials and modes of research in regard to their studio work, Art 578 develops students' ability to as sess the strength of developing work, enhances their ability to speak about their work and the work of their peers and gives thema wider view into issues and aspects of studio production. Includes reading as signments, student-led discussion, guest speakers and field trips. May be repeated for credit. Maximum credits 24 . Required for MFA.
Prerequisite: Admission into the MFA in Contemporary Art Practice program.

## Art 580 -Studio Practice: DirectedStudies (2)

Tutorial and directed study in studio production with a supervising faculty member. In-depth discussions and as sessment of graduate student's studio work-in-progress in relation to contemporary art practices and criticism, his torical practices, technical and formal concerns and/or related interdisciplinary interests. Directed assignments and course of study will be given as appropriate. May be repeated for credit. Maximum credits 40. Required for MFA.

Prerequisite: Admission into the MFA in Contemporary Art Practice program.

## Art 581 -MFA Graduate Seminar I: Special Topics in Contemporary Art (2)

Examines selected is sues in contemporary art and culture. The given instructor's current research interests determine course material. Examples of topics include: post-
colonialismand Diaspora; issues in feminism; genderand queer studies; modernisms and modernity; new technologies and digital culture; autobiography and memoir; cultural production and censorship; globalismand new economies of art. Course format consists of as signed readings, discussion and a writing component. Field trips, student presentations, screenings and as signed lectures may also be included. May be repeated forcredit. Maximum credits 4. Required for MFA.
Prerequisite: Admis sion into the MFA in Contemporary Art Practice program.

## Art 582 - MFA Graduate Seminar II: Writing and Research (2)

Explores the role of writing and research in contemporary art practice. Course materials include library research and developing bibliographies relevant to students' studio practice, discussion of methodologies and practices of contemporary art production. Preparatory course for written component of the MFA exhibition project: secondyearstudents are expected to develop an abstract and outline for their exhibition project. May be repeated for credit. Maximum credits 4 . Required for MFA.

Prerequisite: Admis sion into the MFA in Contemporary Art Practice program.

## Art 583 - MFA Graduate Seminar III: Pedagogy + Praxis (2)

Explores teaching at local and national institutions as preparation for teaching in higher ed. This seminar includes curriculumdevelopment, syllabi development, as sessment, educational objectives reading and discussion of post-modern theory andother matters in the area of art education and visual culture. Required for MFA.
Maximum credits 2.
Prerequisite: Admis sion into the MFA in Contemporary Art Practice program.

## Art 584 -Social Practice: DirectedStudies (2)

Tutorial and directed study in social practice production with a supervis ing faculty member. In-depth discussions and as sessment of graduate student's work-in-progress in relation to contemporary art practices and criticism, historical practices, technical and formal concerns and/or related interdisciplinary interests. Directed as signments and course of study will be given as appropriate. May be repeated for credit. Maximum credits 20 . Required for MFA.

Prerequisite: Admis sion into the MFA in Contemporary Art Practice program.

## Art 585 - MFA Graduate Seminar IV: Professional Practices (2)

Explores practicalissues of career development for professional artists including preparing a portfolio, grant
writing, C.V. writing, applying for teaching positions and residencies, working with museums and galleries, working in and with public, non profit and community arts organizations. The course includes guest speakers and individual research projects. Required forMFA.

Prerequisite: Admission into the MFA in Contemporary Art Practice program.

## Art 586 - Visiting Artist Program (2)

Through presentations and conversations, students will learn about the work of a diverse range of artists and cultural producers. Vis iting artists participate in group critiques, and/or conduct individual studio critiques. May be repeated for credit. Maximum credits 12. Required for MFA.

Prerequisite: Admission into the MFA in Contemporary Art Practice program.

## Art 587 -Exhibition Project (4)

Tutorials and directed study in developing a finalMFA exhibition project. Conduct supporting research and studio production with approval of the students' individual MFA advis or, Exhibition committee chair and committee members. Required forMFA. Maximum credits 4.

Prerequisite: Admission into the MFA in Contemporary Art Practice program.

## Art 590 - Advanced Painting (4)

Through guided individual assis tance, this course concentrates on working methods of research and execution towards a specifically proposed project. Research, idea generation and production are emphasized within the context of a body of work, related to contemporary painting practices and theories.

Also offered for undergraduate-levelcredit as Art 490 and may be taken only once for credit. . Prerequisite: Art 393 or MFA/graduate status or consent of instructor.

## Art 591 - Advanced Painting Topics (4)

Advanced level special topics in painting based on various subjects of inquiry. Focusing on a specific theme, material explorations and applications, and/or specific content, approaches will vary according to instructor. The course should include subtitle highlighting the selected topic.
Also offered for undergraduate-levelcredit as Art 491 and may be taken only once for credit. . Prerequisite: Art 490 or MFA/graduate status or instructor? s consent.
Art 593 - Advanced Drawing Mixed Media (4)
This class represents the culminating experience in drawing and mixed media. Students are expected to develop a unified body of work that reflects and is informed by art his tory and contemporary theory. Open to
non-majors who have prerequisites and consent of the instructor. Maximum8 credits.

Also offered for undergraduate-level credit as Art 493 and may be taken only once for credit. . Prerequisite: Graduatelevel standing and ins tructor's consent.

## Art 594 - Advanced Sculpture (4)

Advanced-level sculpture course which focuses on conceptual development, research, and production as an advanced level sculpture student. Students develop an independent, cohesive body of work within a his torical and theoretical context. Maximum 4 credits.

Also offered for undergraduate-level credit as Art 494 and may be taken only once for credit. . Prerequisite: Graduatelevelstanding.

## Art 595 - Advanced Sculpture Topics (4)

Advanced-level topics in sculpture based on various subjects of inquiry. Focus on a specific theme, media, and/or process. Students develop an independent, cohesive body of work within a historical and theoretical context. Maximum: 8 credits.
Also offered for undergraduate-level credit as Art 495 and may be taken only once for credit. . Prerequis ite: Graduatelevelstanding.

## Art 597 - A History of Art and Social Pracitice (4)

A history of social practice in art. Investigate the current critiques, debates and is sues surrounding its current state in relation to its historical context. The course will examine socialpractice from 1920 to present and touch on the key movements. Will place a strong emphasis on contemporary examples of social practice art through readings, as signments, and online participation. This course will give a historic and critical context for social art. Open to nonmajors.
Also offered for undergraduate-level credit as Art 497 and may be taken only once for credit. . Prerequisite: Graduatelevelstanding.

## Art 598 -Social Practice: Workshop(2)

This course is a co-requis ite to Art 584 SocialPractice: Directed Studies. In this workshop the focus will be on the creative aspects involved in social practice rather than theory. Formulate and work on collaborative public projects, discuss thecreative as pect and practical application of art and social practice. May be repeated for credit. Maximum credits 20. Required for MFA.

Prerequisite: Admis sion into the MFA in Contemporary Art Practice program.

## Art 599 - Exhibition Critique (2)

Public presentation of MFA exhibition project and MFA exhibition lecture; production of written MFA exhibition
statement with the student's individual MFA advisor, graduate faculty and graduate programcoordinator. Required for MFA. Maximum credits 2.
Prerequisite: Admission into the MFA in Contemporary Art Practice program.

## ASc - Arts \& Sciences

ASc 199 - Special Studies (1-4)
(Credit to be arranged.)

## ASc 399 - Special Studies (1-4)

(Credit to be arranged.)

## ASc 402 - Independent Study (1-4)

(Credit to be arranged.)

## ASc 404 - Cooperative Education/Internship (1-12)

(Credit to be arranged.)

## ASc 405 - Reading and Conference (1-8)

(Credit to be arranged.)

## ASc 406 -Special Projects (1-8)

(Credit to be arranged.)

## ASc 408 - Workshop (1-8)

(Credit to be arranged.)

## ASc 409 - Practicum (1-12)

(Credit to be arranged.)

## ASc 410 -SelectedTopics (1-12)

(Credit to be arranged.)

## ASc 504 - Cooperative Education/Internship (1-12)

(Credit to be arranged.)

ASc 509-Practicum (1-12)
(Credit to be arranged.)

## ASc 510 -SelectedTopics (1-6)

(Credit to be arranged.)

## ASL - American Sign Language

## ASL 101 - First-Year American Sign Language Term 1 (4)

Basic mastery of American Sign Language (ASL). Covers ASL vocabulary, grammatical structure, and elements of Deaf culture. Includes sign language practice in class and in the Deaf community. This is the first course in a sequence of three: ASL 101, ASL 102, and ASL 103.

## ASL 102 - First-Year American Sign Language Term 2

 (4)Continuation of American Sign Language with the goal of expanding the student's vocabulary and conversational skills. Students will also gain awareness of Deaf culture. Placement interview may be required. This is the second course in a sequence of three: ASL 101, ASL 102, and ASL 103. Expected preparation: ASL 101 or proficiency at 101 level.

## ASL 103 - First-Year American Sign Language Term3 (4)

Continuation of American Sign Language aimed at intermediate proficiency. Emphasizes enhanced vocabulary, expressive and receptive skills, and communication interactions in the language and culture of the Deaf. This is the third course in a sequence of three: ASL 101, ASL 102, and ASL 103. Expected preparation: ASL 102 or proficiency at 102 level.

## ASL 199 - Special Studies (1-8)

(Credit to be arranged.)

## ASL 201 - Second-Year American Sign Language Term 1 (4)

Expansion and refinement of first-year comprehension and production skills; expansion of grammatical and lexical repertoires through task-based instruction in transactions such as asking/giving directions, making plans, describing and identify ing people, places and things, giving simple instructions, and telling what happened. This is the first course in a sequence of three: ASL 201, ASL 202, and

ASL 203. Expected preparation: ASL 103 for ASL 201, ASL 201 for ASL 202, ASL 202 for ASL 203.

## ASL 202 - Second-Year American Sign Language Term 2 (4)

Expansion and refinement of first-year comprehension and production skills; expansion of grammatical and lexical repertoires through task-based instruction in transactions such as asking/giving directions, making plans, describing and identifying people, places and things, giving simple instructions, and telling what happened. This is the second course in a sequence of three: ASL201, ASL 202, and ASL 203.

## ASL 203 - Second-Year American Sign Language Term 3 (4)

Expansion and refinement of first-year comprehension and productionskills; expansion of grammatical and lexical repertoires through task-based ins truction in transactions such as asking/giving directions, making plans, describing and identifying people, places and things, giving simple instructions, and telling what happened. This is the third course in a sequenceof three: ASL201, ASL 202, and ASL 203.

## ASL 299 - Special Studies (1-8)

(Credit to be arranged.)

## ASL 301 - Third-Year American Sign Language Term 1 (4)

This course will assist students in developing improved and advanced vocabulary, receptive and expres sive skills, and specific terminology used in the fields of education, medicine, law, and artistic/dramatic performances. Students' confidence and fluency in ASL will improve to ensure effective interaction and communication with Deaf and hard of hearing ASLusers.

Prerequisite: ASL203. Corequisite: NA.

## ASL 302 - Third-Year American Sign Language Term 2 (4)

This course aims to improve receptive and expressive fluency of students in two es sential elements of American Sign Language-fingerspelling and numbers-in a variety of contexts and settings. Students will develop mastery of hand positioning and movement pertaining to the use of fingerspelling and numbers in a variety of communication settings and contexts. Students will also improve their abilities to utilize ASL numbering systems for time,
money, measurements, game scores, and others in a variety of settings and contexts.

Prerequisite: ASL301.

## ASL 303 - Third-Year American Sign Language Term 3 (4)

This course focuses on the advanced utilization of gestures, mime, pantomime, facial expressions, body movements, and handshapes that often accompany non-manual communication and which convey meaningful information in American Sign Language. Strategies for developing fluency and skills in these elements will be presented.

Prerequisite: ASL302.

## ASL 330 - Deaf Culture (4)

Introduction to major aspects of American Deaf Culture such as the history of deaf culture and community, its art, literature, folklore and language (American Sign Language), including current attitudes, movements, policies, and trends that affect the Deaf as a linguistic minority.

## ASL 399 - Special Studies (1-8)

(Credit to be arranged.)

ASL402 - Independent Study (1-12)
(Credit to be arranged.)

## ASL406 - Special Project/Problems (1-12)

(Credit to be arranged.)

## ASL 410 - SelectedStudies (1-12)

(Credit to be arranged.)

## BA - Business Administration

## BA100 - Summer Business Institute (1)

The Summer Business Institute is a unique opportunity for high school students to explore the world of business with Portland State business faculty and local business leaders. The institute will provide an overview of the functional areas of business and business practices in Oregon with an emphas is on diversity and inclusion and social responsibility. The institute is specially designed for Black, Indigenous, people of color, and those with culturally diverse backgrounds. This course is repeatable for up to 2 credits.

## BA 101 - Introduction to Business and World Affairs (4)

Introduction to the business firmoperating in the local, national, and global marketplace. Emphas izes the integration of the various functional areas of business as the firm evolves fromits entrepreneurial origins to a mature corporation.

## BA199 - Special Studies (1-6)

(Credit to be arranged.)

## BA 205 - Business Communications Using Technology (4)

Provides students with the tools that are needed to collect, organize, and present information in a business environment. Students will learn how to use library and Internet res ources to collect information. Word processing, spreadsheet, and graphics applications will be used to org anize and present business information. Students will be introduced to business report writing, developing and delivering a persuasive presentation, and electronic-mail methods for teambased communication.

Prerequisite: BA 101.

## BA 211 - Fundamentals of Financial Accounting (4)

Assists students in developing an understanding of financial statements and the tools used by external users such as lenders, shareholders, and competitors to evaluate the performance of the firm. Balance sheets, income statements, statements of cash flows, and industry reports will be used to introduce topics such as: assessing risk, liquidity, solvency, operating efficiency, and profitability of the firm.

Prerequisite: BA 101.

## BA 213 - Decision Making with Accounting Information (4)

Designed to aid students in developing effective decision making skills. Course elements include: understanding the organization as a system, information assessment, cash management, operations and capital budgeting, manufacturing cost systems, cost control procedures, managing inventory, problemsolving, and measuring the health of the organization.
Prerequisite: BA 211.

## BA 216 - Applied Excel for Business (2)

Applied Excel for Business is required for all business students because of the foundational role Excel plays in their future coursework and career. Students will use

SIMnet simulation software to learn selected practical tasks in Excel 2019, as well as learn more advanced features of Excel through applied projects. The Final Exam for the class is the Microsoft Office Excel 2019 Certification Exam.

Prerequisite: BA 101.

## BA 299 - Special Studies (1-6)

(Credit to be arranged.)

## BA 300 - Business andProfessional Communication (2)

Designed to introduce the conceptual framework and specific tools necessary for communicating in complex environments and accomplis hing strategic academic and professional business goals. Provides the written and collaborative skills necessary for business professionals. Students will develop awareness of personal strengths and weaknesses in business communication and learn how to incorporate these into strong communication end results.

Prerequisite: BA 213, BA 216, Comm 220, Ec 202, Stat 241 OR Stat 243, and Wr 121 or the third termof FRINQ.
BA 301 - Research and Analysis of Business Problems (4)

Development and use of business tools and techniques as applied to business problems. Students will identify business problems, articulate the is sues, research, develop, and evaluate solution alternatives relevant to the problem, and present the results orally and in writing. Students will integrate and reinforce theirskills in logical and analytical processing, critical thinking, and communication.
Prerequisite: BA 205, BA 213, Comm 220, Stat 241 or Stat 243 , Ec 202, and Wr 121 or the third termof FRINQ.

## BA302 - Organizational Behavior (0-4)

Focuses on is sues that are relevant to the three levels of organizational behavior (i.e., individual, group, and org anizational). Key topics include: the nature and dynamics of teams, personal values and employee job attitudes, communication, conflict resolution, motivation, leadership, decision making, employee effectiveness, and the impact of organizational level is sues such as policies, structure, design, and culture. Techniques used to facilitate learning may include role plays, cases, presentations, organizational simulations, teamwork, and/or termresearch papers.
Prerequisite: BA 301 or concurrent registration in BA 301.

## BA 303 - Business Finance (4)

Development and study of a decision framework for financial management with special emphasis on small-and medium-sized businesses. Topics include analysis of financial health, planning for future financial performance,
evaluation of investment opportunities, and analyses of risk. Financing of firm growth and valuation will be introduced. An integration of the concepts of financial management into a total systemapproach to business decision making will be facilitated with the use of cases, as appropriate.

Prerequisite: BA 213, Ec 202, Stat 241 or Stat 243.

## BA306U - Essentials of Finance for Non-Business Majors (4)

Essential topics in accounting and finance for business minors and non-business majors. Reading and interpreting income statements and balance sheets, especially for small bus inesses. Forecasting to determine financing requirements. Use of techniques in time value of money to determine present values, loan payments, etc. Sources of businessfinancing.

## BA311 - Marketing Management (4)

Basic marketing concepts fromthe perspective of the marketing manager. Key focus is to examine the marketing planning and analysis necessary to develop sound marketing plans and strategies. Specific topics include the role of marketing within the firm, analysis of marketing opportunities, selection of target markets and market segmentation, marketing strategies in a global marketplace, use of technology in marketing, and marketing mix decisions. Experiential learning approaches for class participation will be used.

Prerequisite: BA 301 or concurrent registration in BA 301.

## BA 316U- Essentials of Marketing for Non-Business Majors (4)

Essential topics in marketing for business minors and nonbusinessmajors. Students will be introduced to the basic concepts of marketing and customer satisfaction. Students will explore primary considerations of the market environment and marketing practices including price, promotion, distribution, and product in an applied setting.

## BA 325 - Information Literacy \& Technical Competence for Business Professionals (4)

Presents the key information literacy skills future business leaders need to be successful. Data represent people, places, things, activities, and events in a business. Making senseof these data is the work of every business person at all levels of the organization. The course is designed to do three things; help students develop proficiency in MS Excel and Access software applications, (2) develop the thinking that is required for students to dive into data and make sense of it, and (3) introduce key information and technology related concepts of which every business person should be aware. Using adaptive technology
(SimNet), the course is designed to provide students with working knowledge and a broad overview of applications they will utilize throughout their time at PSU and bey ond. Students have long-termaccess to the SimNet library so the resource travels with them throughout theireducation and career.

Prerequisite: BA 213, Ec 202, Stat 241 or Stat 244.

## BA 326U- Essentials of Management for Non-Business Majors (4)

Essential topics in management and business communications for business minors and non-business majors. Focuses on the management of business organizations in an applied setting. Key topics include motivating and leading individuals and groups, working effectively in teams, and conflict management. In addition, students will learn to collect, organize, and present information in a business setting.

## BA 327 - Data Analysis \& Visualization (2)

This course is required of all business students in order for themto have basic competency in Data Analytics and be able to succeed in 400-level discipline specific Data Analytics courses as well as for themto performwell in the BA 495 Caps tone class. Using a large dataset from industry, this two-credit combined-lab-and-lecture course will give students experience with tools while walking themthrough the dataanaly tics cycle in order to prepare students for the work force, and their 400-level SB coursework.
Prerequisite: BA 325.

## BA 332U- Property, Management \& Society (4)

Introduces students to the field of real estate property management. Students attain fundamental knowledge of real estate, economics and the built environment's impact on communities. Encompasses managerial concepts, operational principles, market economics and real estate terminology for income-producing properties.

## BA 336U- Essentials of Information Technology for Non-Business Majors (4)

Discusses the importanceof information and its support of a business organization. An understanding of the essential relationships among information, business process, and information technology. This is a survey course for businessminors and non-business majors.

## BA339 - Supply Chain Management (4)

Develops an understanding of the various is sues and strategies involved in the operation of a service or
manufacturing organization. These considerations include the support by the operation's organization of corporate strategy through design and operating decisions. Issues such as global supply sources, worldwide business system influences, continuous improvement, and total quality management will be discussed.

Prerequisite: BA 301 or concurrent registration in BA 301.

## BA 339L- Lab for BA 339 (0)

Lab for BA 339.

## BA 346U- Essentials of Entrepreneurshipfor NonBusiness Majors (4)

Team-based capstone course in the business minor that provides students experience developing a new business opportunity and transferable skills applicable to entrepreneurship, intrapreneurship, and the promotion of new initiatives within an org anization. Students will develop a final project that involves determining the market potential and strategy for a business idea using collaboration tools to create a feasibility study and a businesspitch.

## BA 385 - Business Environment (4)

Study andcriticalanalysis of the role of business in its environment with special references to the interrelationships of legal, technological, economic, political, and social forces with the business enterprise and to the legal and ethical obligations of the business enterprise with its owners, employees, consumers, and society.
Prerequisite: BA 301.
BA 399 - Special Studies (1-6)
(Credit to be arranged.)

## BA401 - Research (1-12)

(Credit to be arranged.)

## BA 404 - Internship (1-12)

(Credit to be arranged.)

## BA407-Seminar (1-9)

(Credit to be arranged.) Seminars in selected crossfunctional and integrative business topics.

## BABA - Practicum(1-12)

(Credit to be arranged.)

## BA410-SelectedTopics (1-6)

(Credit to be arranged.)

## BA 423 - Executive Perspectives on Leadership(1)

This course provides students the opportunity to interact and learn directly fromexecutives at for-profit, not-forprofit and government organizations. Students will listen to and discuss the concepts and practices of leadership as it relates to the professional experiences of the executives.
Also offered for graduate-level credit as BA 523.

## BA 495 - Business Strategy (6)

Capstone course for the SBA; should be taken in the student's final term. This course meets University Studies' Capstone requirement. Students learn to systematically analyze a firm's internal and external environments and, through engagement with community partners, apply concepts and theories related to the formulation and implementation of business/org anization strategies. Students join an interdisciplinary team; pool their knowledge, skills, and interests; use strategy to address a problemor concern of the community partner. Emphas is on multiple functions and perspectives to understand diverse management and stakeholder interpretations, conceive integrative solutions, and address social and organizational outcomes.
Prerequisite: BA 301, BA 302, BA 303, BA 311, BA 325, BA 339, and BA 385. Priority to graduating seniors who have applied for graduation.
BA 501 - Research (1-9)
(Credit to be arranged.)

## BA504-Cooperative Education/Internship (1-12)

(Credit to be arranged.)

## BA 505 - Reading \& Conference (1-8)

(Credit to be arranged.)

## BA 506-Special Projects (2-6)

Credit to be arranged.

## BA 507 - Seminar (1-9)

(Credit to be arranged.) Seminars in selected crossfunctional and integrative business topics.

## BA 508 - Workshop(2)

Credit to be arranged.

## BA509-Practicum(1)

Credit to be arranged.

## BA510 - SelectedStudies (1-9)

(Credit to be arranged.)

## BA 521 - Leadership Assessment and Development (2)

This course is the first stage for the development of leaders hip competencies in the MBA program. Students will be involved in various activities to as sess and develop their interpersonal, communication, problem solving, and systems thinking competencies, and will use the results of their assessments to write a personal development plan.

## BA 522 - Communications for Leaders (1)

Focus on building effective communication skills, including writing, speaking and listening. Students will learn how to create and engage in clear and well-structured communications - both oral and written. Students will be introduced specific techniques that students can use to increase their effectiveness as communicators, engage their audience and respond to 'expected' and 'unexpected' questions that arise in a way that is authentic, collaborative and influential.

## BA523-Executive Perspectives on Leadership(1)

This course provides students thatopportunity to interact and learn directly fromexecutives at for-profit, not-forprofit and government organizations. Students will listen to and discuss the concepts and practices of leadership as it relates to the professional experiences of the executives.
Also offered for undergraduate-levelcredit as BA 423.

## BA 524 - Leadership Immersion (1)

A business simulation experience designed to assess students' technical and leadership skills. This course can only be taken as a pass/no pass grading option.
Prerequisite: Ba, 521, BA 522, BA 529, Fin 513.

## BA 525 - Capstone Consulting Project (2)

Under the direction of a faculty member, students work in teams over two terms to apply MBA knowledge, skills and leadership competencies to an actual organizational problemin a consulting framework. This course requires two consecutive terms to complete. MBA prerequisites: BA 529, Mgmt 511, Mgmt 516, Fin 513, Mktg 511, Mktg 512, BA 524 (may be taken concurrently); and completion of at least 37 hours of the MBA core sequence.

## BA 526 - MBA International Experience (4)

The MBA International Experience provides the opportunity for students to study international business and intercultural topics and gain hands-on experience in a different country or in the Portland Metro region. Locations and course topics are determined based on the strategic priorities of the MBA program. International Experiences conducted in different countries require approximately two weeks overseas. International Experience conducted in the Portland Metro region will be offered in four to eight week formats.
Prerequisite: Students will need to have completed the first year of their MBA programin orderto participate in the MBA International Experience.

## BA 527 - MBA Domestic Business Experience (4)

Explores global business is sues through the lens of one or more of the region's key industry sectors. Students will learn from executives and innovators leading groundbreaking globalefforts and initiatives.
Corequisite: BA 528.

## BA 528 - MBA Culture Module (1)

This course is intended to help students prepare for their international experience trips by developing a greater understanding of culture and cross-culturalcommunication in the business setting.

## BA 529 - Building Effective Teams (1)

The purpose of this course is to teach the theory and processes of group and teambehavior so thatstudents can successfully manage groups and work effectively in a variety of teamsettings.

## BA 530 - Thought Leadership (1)

Under the direction of a faculty member, students will examine relevant topics in business, and explore the connection between academic research and theneeds of the businesscommunity.

## BA 548 - Special Topics in Business (1-6)

The courses offered under this number cover a range of specialized topics in business such as Product Design and Stewardship for Global Corporations, Sustainability Metrics in Business, Cross-Sector Partnerships for Sustainable Enterprise, Global Marketing Research, Marketing in Asia, Global Marketing, GlobalHuman Resource Management, etc. Only open to graduate students of the School of Bus iness Adminis tration. May be repeated with different topics; maximum of 12 credits may be applied to the master's degree.

## BBE - Bilingual Bicultural Ed

BBE404-Cooperative Education/Internship (1-12)
(Credit to be arranged.)

## BBE407-Seminar (1-12)

(Credit to be arranged.)

## BBE410 - SelectedStudies (1-12)

(Credit to be arranged.)

## BBE422 - Human Development and Learning in Multicultural/Multilingual Communities (4)

Utilizes an interdisciplinary approach to view human development and learning processes across identity and culture. Drawing fromfields such as education, psychology, anthropology, and sociology, students will critically explore the socialization process children undergo within their multilingual/multicultural families and communities. The interaction between the institutions of families, communities, and schools is the focus for future bilingual educators.
Also offered for graduate-level credit as BBE 522 and may be taken only once forcredit. Prerequisite: Admis sion into the Bilingual Teacher Pathway Program.

## BBE424 - Professional Development and Reflection (2)

Course designed to assist students in the beginning development of their profession as teachers, become familiar with national, state, and district teaching standards for teachers and K-12 students and become knowledgeable on educational law. Students will develop an initial teaching philosophy paper that will reflect their personal expression of values and goals as they relate to their practice. This paper will be refined throughout the program. Additionally, students will begin observation and data gathering in their district's learning community.

Also offered for graduate-level credit as BBE 524 and may be taken only once for credit. Prerequisite: Admis sion to the Bilingual Teacher Pathway Program.

## BBE 432 -Language and Literacy Development for Diverse Learners (3)

Course designed for preservice teachers to help themguide elementary, mid-level, and secondary students in acquiring skills needed for reading, thinking, writing, and study in the content areas. Emphas is on the functional teaching of reading and writing- the design and preparation of materials to use with textbooks in all schoolsubjects.

Als o offered for graduate-level credit as BBE 532 and may be taken only oncefor credit. Prerequis ite: Admission to the BilingualTeacherPathway Program.

## BBE 434 -Planning, Assessment, and Curriculum (3)

This course explores the theoretical frameworks and practical strategies that as sist new teachers in planning effective classroom curriculum, as sessments and instruction across academic subject areas, while focusing on the developmental and learning needs of students. Students will learn and practice a variety of techniques for unit and lesson planning, thoughtful ins tructional strategies and best practices in specific content areas, and how to develop formativeclassroomas sessments that are standards-based and are aligned with ins truction and curriculumdesign.
Also offered for graduate-level credit as BBE 534 and may be taken only oncefor credit. Prerequis ite: Admission to the BilingualTeacher Pathway Program.

## BBE442 -Elementary Mathematics Methods for Dual Language Learners (3)

Emphasizes meaningful understanding of elementary-level mathematics content with a particular focus on is sues of socialjustice andequity in mathematics teaching and learning. Situates teaching, learning, and assessment within the context of state and national standards as well as research proven practices for working with all students and in particular, English language learners. Focuses on strategies for developing competence with teaching through problem solving and teaching students in a developmentally appropriate, culturally res ponsive manner.
Also offered for graduate-level credit as BBE 542 and may be taken only once for credit. Prerequisite: Admission into the BilingualTeacher Pathway Program.

## BBE 444 -Culturally Responsive Learning Environment (3)

Grounded in the principle that "cultural relevance" is a vital component in environments to engagestudents' cognitive processing for learning. Students will explore designing the social, physical, and instructional
environment to incorporate cultural information and processes to scaffold learning. Course participants will engage in problem solving, establishing expectations, agreements, routines, and organizational procedures with attention to communal awareness, authentic relationships, and collaboration with staff, adminis trators, and families.

Also offered for graduate-level credit as BBE 544 and may be taken only once for credit. Prerequis ite: Admis sion into the Bilingual Teacher Pathway Program.

## BBE448-Biliteracy Development for Dual Language Learners (3)

Designed for bilingual preservice teacher candidates to help themunderstand and guide the literacy development of emerging bilingual and dual language elementary students in acquiring skills needed for reading and writing in two languages. Candidates will examine and compare literacy development across two languages and explore instructional practices that make connections to students' cultural and linguistic assets, as well as the cultural wealth of their families and communities.
Also offered for graduate-level credit as BBE 548 and may be taken only once for credit. Prerequisite: Admis sion into the Bilingual Teacher Pathway Program.

## BBE452 - Integrating Arts in Elementary Methods (3)

Students will consider how integrating the arts into various content areas strengthen learning across the curriculum and nurture students' culture and identity. Emphasizes inquiry processes in the content areas and project-based approaches to teaching and integrating arts into grades PreK-8. Specific attention paid to engagement strategies as well as non-verbal supports fors second language comprehension. Developing and articulating a cogent rationale for alternative key strategies is a key component in this course of study.
Also offered for graduate-level credit as BBE 552 and may be taken only once for credit. Prerequis ite: Admis sion into the Bilingual Teacher Pathway Program.

## BBE454 - Technology and Education (3)

Use of digital tools to enhance teacher productivity and support the teaching and learning cycle of planning, instruction, and assessment. Candidates will engage in hands-on professional development to explore and apply technology to foster elementary emerging bilingual and dual language learner's inquiry, communication, collaboration, creation, visual design and production of media. Topics will include media literacy and digital citizenship within linguistically and culturally diverse settings.
Also offered for graduate-levelcredit as BBE 554 and may be taken only once for credit. Prerequis ite: Admis sions into the Bilingual Teacher Pathway Program.

## BBE 462 -Science Methods for Elementary DualLanguage Learners (3)

Emphasis on effective methods and practices for developing integrated, interdisciplinary units of instruction. Explore approaches to teaching science at the elementary grades and integrating science content and processes with content and processes fromother content areas (e.g., literacy, mathematics, the arts). Learn how to connect effective science lessons to relevant standards and objectives while advancing language and literacy for English Learners. Employ the natural curiosity of all children to teach the scientific method and the design cycle through culturally relevant activities.
Also offered for graduate-level credit as BBE 562 and may be taken only once for credit. Prerequis ite: Admis sions into the BilingualTeacher Pathway Program.

## BBE472-Literacy Development in the Content Area (3)

Course designed for bilingual and bicultural preservice teacher candidates to help themguide elementary students in developing literacy in the content areas. Emphasis on acquiring the specific knowledge and literacy skills in reading, writing, thinking, and speaking for content area achievement.

Also offered for graduate-level credit as BBE 572 and may be taken only once for credit. Prerequisite: Admission into the Bilingual Teacher Pathway Program.

## BBE 474 - Biliteracy Assessment for Dual Language Learners (1-3)

Designed for bilingual preservice teacher candidates to help themunderstand and guide the assessment of literacy development of emerging bilingual and dual language elementary students. Candidates will examine and compare various language and literacy assessment instruments that will enable themto monitor the development across two languages and related literacy skills. Topics of dyslexia and other common literacy phenomena in bilingual communities will be explored. The course may be repeated for up to 3 credits.
Also offered for graduate-level credit as BBE 574. Prerequisite: Admis sion into the Bilingual Teacher Pathway Program. Passing grade in BBE 448.

## BBE 480 - Inquiry and Reflective Practitioner (2-8)

This three-termcourse occurs as teacher candidates prepare for and complete their student teaching field experience. The course is designed to help candidates implement the cycle of planning, teaching, and assessment. As future bilingual teachers, they will engage in reflective practice as well as explore and inquire into educational practices within multilingual and multicultural settings. The inquiry process and skills of a reflective practitioner are critical in working with learners, families, and
communities. The course may be repeated for up to 8 credits.

Also offered for graduate-level credit as BBE 580. Prerequisite: Admission into the Bilingual Teacher Pathway Program.

## BBE502 - Independent Study (1-9)

(Credit to be arranged.)

## BBE504-Cooperative Education/Internship (1-9)

(Credit to be arranged.)

## BBE507-Seminar (1-6)

(Credit to be arranged.)

## BBE509 - Practicum(1-9)

(Credit to be arranged.)

## BBE510 - SelectedStudies (1-15)

(Credit to be arranged.)

## BBE 522 - Human Development and Learning in Multicultural/Multilingual Communities (4)

Utilizes an interdisciplinary approach to view human development and learning processes across identity and culture. Drawing fromfields such as education, psychology, anthropology, and sociology, students will critically explore the socialization process children undergo within their multilingual/multicultural families and communities. The interaction between the institutions of families, communities, and schools is the focus for future bilingual educators.

Also offered for undergraduate-levelcredit as BBE422 and may be taken only once for credit. Prerequisite: Admis sion into the Bilingual Teacher Pathway Prog ram.

BBE524-Professional Development and Reflection (2)
Course designed to assiststudents in the beginning development of their profession as teachers, become familiar with national, state, and district teaching standards for teachers and K-12 students and become knowledgeable on educational law. Students will develop an initial teaching philosophy paper that will reflect their personal expression of values and goals as they relate to their practice. This paper will be refined throughout the program. Additionally, students will begin observation and data gathering in their district's learning community.

Also offered for undergraduate-level credit as BBE424 and may be taken only once for credit. Prerequisite: Admission to the Bilingual Teacher Pathway Program.

BBE 532 -Language and Literacy Development for Diverse Learners (3)
Course designed for preservice teachers to help themguide elementary, mid-level, and secondary students in acquiring skills needed for reading, thinking, writing, and study in the content areas. Emphas is on the functional teaching of reading and writing-the design and preparation of materials to use with textbooks in all schoolsubjects.

Also offered for undergraduate-level credit as BBE432 and may be taken only once forcredit. Prerequisite: Admis sion to the Bilingual Teacher Pathway Program.

## BBE 534 -Planning, Assessment, and Curriculum (3)

This course explores the theoretical frameworks and practical strategies that assist new teachers in planning effective classroomcurriculum, assessments and instruction across academic subject areas, while focusing on the developmental and learning needs of students. Students will learn and practice a variety of techniques for unit and lesson planning, thoughtfulinstructional strategies and best practices in specific content areas, and how to develop formativeclassroomas sessments that are standards-based and are aligned with ins truction and curriculumdesign.
Also offered for undergraduate-level credit as BBE434 and may be taken only once for credit. Prerequisite: Admission to the Bilingual Teacher Pathway Program.
BBE 542 - Elementary Mathematics Methods for Dual Language Learners (3)
Emphasizes meaningful understanding of elementary-level mathematics content with a particularfocus on is sues of social justice and equity in mathematics teaching and learning. Situates teaching, learning, and assessment within the context of state and national standards as well as research proven practices for working with all students and in particular, English language learners. Focuses on strategies for developing competence with teaching through problemsolving and teaching students in a developmentally appropriate, culturally res ponsive manner.
Also offered for undergraduate-level credit as BBE442 and may be taken only once for credit. Prerequisite: Admis sion into the Bilingual Teacher Pathway Program.

## BBE 544 -Culturally Responsive Learning

 Environment (3)Grounded in the principle that "cultural relevance" is a vital component in environments to engagestudents' cognitive processing for learning. Students will explore designing the social, physical, and instructional
environment to incorporate cultural information and processes to scaffold learning. Course participants will engage in problemsolving, establishing expectations, agreements, routines, and org anizational procedures with attention to communal awareness, authentic relationships, and collaboration with staff, adminis trators, and families.

Also offered for undergraduate-level credit as BBE444 and may be taken only once for credit. Prerequisite: Admis sion into the Bilingual Teacher Path way Program.

## BBE 548 - Biliteracy Development for Dual Language Learners (3)

Designed for bilingual preservice teachercandidates to help themunderstand and guide the literacy development of emerging bilingual and dual language elementary students in acquiring skills needed for reading and writing in two languages. Candidates will examine and compare literacy development across two languages and explore ins tructional practices that make connections to students' cultural and linguistic assets, as well as the cultural wealth of their families and communities.
Also offered for undergraduate-level credit as BBE448 and may be taken only once for credit. Prerequisite: Admis sion into the Bilingual Teacher Pathway Program.

## BBE552 - Integrating Arts in Elementary Methods (3)

Students will consider how integrating the arts into various content areas strengthen learning across the curriculumand nurture students' culture and identity. Emphasizes inquiry processes in the content areas and project-based approaches to teaching and learning in grades PreK-8. Specific attention paid to engagement strategies as well as non-verbal supports for second language comprehension. Developing and articulating a cogent rationale for alternative key strategies is a key component in this course of study.
Also offered for undergraduate-levelcredit as BBE452 and may be taken only once for credit. Prerequisite: Admis sion into the Bilingual Teacher Pathway Program.

## BBE554-Technology and Education (3)

Use of digital tools to enhance teacher productivity and support the teaching and learning cycle of planning, instruction, and assessment. Candidates will engage in hands-on professional development to explore and apply technology to foster elementary emerging bilingual and dual language learner's inquiry, communication, collaboration, creation, visual design and production of media. Topics will include media literacy and digital citizenship within linguistically and culturally diverse settings.
Also offered for undergraduate-level credit as BBE454 and may be taken only once for credit. Prerequisite: Admis sions into the Bilingual Teacher Pathway Program.

## BBE 562 -Science Methods for Eementary DualLanguage Learners (3)

Emphasis on effective methods and practices for developing integrated, interdisciplinary units of instruction. Explore approaches to teaching science at the elementary grades and integrating science content and processes with content and processes fromother content areas (e.g., literacy, mathematics, the arts). Learn how to connect effective science lessons to relevantstandards and objectives while advancing language and literacy for English Learners. Employ the natural curiosity of all children to teach the scientific method and the design cycle through culturally relevant activities.
Also offered for undergraduate-level credit as BBE462 and may be taken only once for credit. Prerequisite: Admis sions into the Bilingual Teacher Pathway Program.

## BBE 572 -Literacy Development in the Content Area (3)

Course designed for bilingual and bicultural preservice teacher candidates to help themguide elementary students in developing literacy in the content areas. Emphas is on acquiring the specific knowledge and literacy skills in reading, writing, thinking, and speaking for content area achievement.

Also offered for undergraduate-level credit as BBE472 and may be taken only once for credit. Prerequisite: Admis sion into the Bilingual Teacher Pathway Program.

## BBE 574 -Biliteracy Assessment for Dual Language Learners (1-3)

Designed for bilingual preservice teacher candidates to help themunderstand and guide the assessment of literacy development of emerg ing bilingual and dual language elementary students. Candidates will examine and compare various language and literacy assessment instruments that will enable themto monitor the development across two languages and related literacy skills. Topics of dyslexia and other common literacy phenomenain bilingual communities will be explored. The course may be repeated for up to 3 credits.
Also offered for undergraduate-level credit as BBE474. Prerequisite: Admis sion into the Bilingual Teacher Pathway Program. Passing grade in BBE 548.

## BBE 580 - Inquiry and Reflective Practitioner (2-8)

This three-termcourse occurs as teacher candidates prepare for and complete their student teaching field experience. The course is designed to help candidates implement the cycle of planning, teaching, and assessment. As future bilingual teachers, they will engage in reflective practice as well as explore and inquire into educational practices within multilingual and multicultural settings. The inquiry process and skills of a reflective practitioner are critical in working with learners, families, and
communities. The course may be repeated for up to 8 credits.

Also offered for undergraduate-levelcredit as BBE480. Prerequisite: Admission into the Bilingual Teacher Pathway Program.

## Bi - Biology

## Bi 101 - General Biology (3)

The fundamental principles of life as they apply to both plants and animals. If taken after completing courses with similar materials credit will be restricted This is first course in a sequenceof three: $\mathrm{Bi} 101, \mathrm{Bi} 102$, and Bi 103. Concurrentenrollment in Bi 104, Bi 105, Bi 106 required.

## Bi 102 - General Biology (3)

The fundamental principles of life as they apply to both plants and animals. If taken after completing courses with similar materials credit will be restricted This is second course in a sequenceof three: Bi 101 , Bi 102 , and Bi 103. Concurrentenrollment in Bi 104 , Bi 105, Bi 106 required.

## Bi 103 - General Biology (3)

The fundamental principles of life as they apply to both plants and animals. If taken after completing courses with similar materials credit will be restricted This is third course in a sequenceof three: Bi 101 , Bi 102 , and Bi 103. Concurrentenrollment in Bi 104 , Bi 105, Bi 106 required.

## Bi 104 - General Biology Labs (1)

Laboratory to accompany General Biology ( $\mathrm{Bi} 101, \mathrm{Bi}$ 102 , Bi 103 ). This is the first lab in a sequence of three: Bi 104, Bi 105, and Bi 106. Previous or concurrent enrollment in $101,102,103$ is required. One 2-hour laboratory per week.

Corequisite: Bi 101.

## Bi 105 - General Biology Labs (1)

Laboratory to accompany General Biology (Bi 101, Bi
$102, \mathrm{Bi} 103$ ). This is the second lab in a sequence of three: Bi 104, Bi 105, and Bi 106. Previous orconcurrent enrollment in 101, 102, 103 is required. One 2-hour laboratory per week.

## Bi 106 - General Biology Labs (1)

Laboratory to accompany General Biology ( $\mathrm{Bi} 101, \mathrm{Bi}$
102, Bi 103). This is the third lab in a sequence of three: Bi 104, Bi 105, and Bi 106. Previous or concurrent enrollment
in $101,102,103$ is required. One 2-hour laboratory per week.

## Bi 161 -Food, Plants, and People (3)

The role of plants in human affairs as sources of food, fiber, fuel, beverages, and drugs. This course does not satisfy the Department of Biology botany course requirement and is intended for nonmajors.

## Bi 163 - Organic Gardening (3)

An in-depth study of the principles and practices of modern home gardening. Plants, soils, and climates are studied in relation to the production of vegetables, herbs, flowers, and perennial food plants. The organic and chemical approaches to gardening are discussed with the goal of helping students to formulate intelligently their own philos ophy of gardening. Not intended for biology majors.

## Bi 175 - Evolutionary Concepts (3)

This class is designed to provide background in evolutionary concepts for nonmajors and to address current is sues in evolution as they are perceived and are being investigated by various members of our faculty in biology and geology. It is a combined lecture and discussion class and will include occasional guest lecturers presenting their research and views on various topics in evolution.

## Bi 199 - Special Studies (1-5)

Please see department for course description. (Credit to be arranged.)

## Bi 201 -Fundamentals of Biology: Cells, Genes and Heredity (3)

An overview of basic concepts of biology and applications to everyday life. Topics include the material bas is of living systems; cell and molecular structures and interactions, and genetics and heredity, as applied to is sues such as cancer, nutrition, reproductive and genetic testing, and biotechnology. Fulfills the sciencerequirement for nonmajors. This course will not fulfill biology major requirements or pre-allied health requirements for introductory biology.

## Bi 202 - Fundamentals of Biology: Ecology, Conservation, and Health (3)

A fundamental introduction to the biological concepts and principles underlying the relationships among ecology, conservation, sustainability, and public health. Topics include ecological principles, population ecology, and public health. These will translate into a better scientific understanding of ecology and health. Fulfills the science requirements for non-majors. This course will not fulfill biology major requirements or pre-allied health requirements for introductory biology.

## Bi 203 - Fundamentals of Biology: Evolution and Diversity of Life (3)

An introduction tofundamental principles of evolution, origins, and diversity of life on Earth. Topics include history, development, mechanisms and processes of evolution, patterns of ancestry, diversity and extinction, and surveys of the major life forms including the origin and evolution of modernhumans. Fulfills the science requirement for non-majors. This course will not fulfill biology major requirements or pre-allied health requirements for introductory biology.

## Bi 204 - Fundamentals of Biology Laboratory: Cells, Genes and Heredity (1)

A laboratory course to accompany Bi 201 Fundamentals of Biology. Hands-on inquiry and investigations of topics relating to the material basis of living systems; cell and molecular structures and interactions, and genetics and heredity. Fulfills the university laboratory science requirement.

## Bi 205 - Fundamentals of Biology Laboratory: Ecology Conservation and Health (1)

A laboratory courseto accompany $\operatorname{Bi} 202$ Fundamentals of Biology. Hands-on inquiry and investigations of topics relating to ecological systems, conservation biology, and human public health. Fulfills the university laboratory science requirement. Expected preparation: high school biology.

## Bi 206 - Fundamentals of Biology Lab: Evolution and Diversity of Life (1)

A laboratory course to accompany Bi 203 Fundamentals of Biology. Hands-on inquiry and investigations of topics relating to the major groups of organisms. Fulfills the univers ity laboratory science requirement.

## Bi 207 - Biology for AlliedHealth I (4)

Three-term preparatory biology lecture and integrated lab course fors tudents preparing for allied health career tracks. Bi 207: Cell, Molecular and Genetics: topics include cell structure and function, molecular basis of life, cellular bas is of reproduction, heredity and genetics. Bi 208 : Evolution and Diversity of Life: topics include origin and evolution of diversity of life from viruses and microbes to vertebrates; animal behavior, organismal interactions. Bi 209: Anatomy andPhysiology Systems: topics include skeletal, circulatory, respiratory, digestive, urinary, endocrine, nervous, immunological, reproductive sy stems; org anization, development, and homeostasis in animals. Integrated lab exercis es emphasize the process of scientific inquiry using critical thinking and communication skills. This is the first course in a sequence of three: Bi 207 , Bi 208, and Bi 209.
Corequisite: Bi 207L.

## Bi 207L - Biology for Allied Health Lab I (0)

Biology for Allied Health Lab.
Corequisite: Bi 207.

## Bi 208 -Biology for AlliedHealth: Evolution and Diversity of Life (4)

Three-term preparatory biology lecture and integrated lab course for students preparing for allied health career tracks. Bi 207: Cell, Molecular and Genetics: topics includecell structure and function, molecular basis of life, cellular bas is of reproduction, heredity and genetics. Bi 208: Evolution and Diversity of Life: topics include origin and evolution of diversity of life from viruses and microbes to vertebrates; animal behavior, organismal interactions. Bi 209: Anatomy andPhysiology Systems: topics include skeletal, circulatory, respiratory, digestive, urinary, endocrine, nervous, immunological, reproductive sy stems; org anization, development, and homeostasis in animals. Integrated lab exercis es emphasize the process of scientific inquiry using critical thinking and communication skills. This is the second course in a sequence of three: $\mathrm{Bi} 207, \mathrm{Bi}$ 208, and Bi 209.

Corequisite: Bi 208L.
Bi 208L - Biology for Allied Health Lab II (0)
Biology for Allied Health Lab.
Corequisite: Bi 208.

## Bi 209 - Biology for AlliedHealth: Anatomy and Physiology Systems (4)

Three-term preparatory biology lecture and integrated lab course forstudents preparing for allied health career tracks. Bi 207: Cell, Molecular and Genetics: topics includecell structure and function, molecular basis of life, cellular bas is of reproduction, heredity and genetics. Bi 208 :

Evolution and Diversity of Life: topics include origin and evolution of diversity of life from viruses and microbes to vertebrates; animalbehavior, org anismal interactions. Bi 209: Anatomy and Physiology Systems: topics include skeletal, circulatory, respiratory, digestive, urinary, endocrine, nervous, immunological, reproductive systems; organization, development, and homeostasis in animals. Integrated lab exercis es emphasize the process of scientific inquiry using critical thinking and communication skills. This is the third course in a sequence of three: $\mathrm{Bi} 207, \mathrm{Bi}$ 208, and Bi 209.

Corequisite: Bi 209L.
Bi 209L - Biology for AlliedHealth Lab III (0)
Biology for Allied Health Lab.
Corequisite: Bi 209.

## Bi 211 - Principles of Biology: Biology of Cells (4)

Study of the biology of cells. The course includes an introduction to the scientific method, cellbiochemistry, cellular and molecular biology, and Mendelian genetics. This is one of six courses ( $\mathrm{Bi} 211-6$ ), which together provide broad foundational preparation for furthers study in the biological sciences. Fourhours lecture.

Prerequisite: Ch 221 and Ch 227, or concurrent enrollment in Ch 221 and Ch 227. Corequisite: $\operatorname{Bi} 214$.

## Bi 212 - Principles of Biology: The biology of organisms (4)

Study of the biology of organisms. The course includes molecular biology and the physiology and anatomy of plants and animals. Four hours lecture. This is one of six courses (Bi 211-6), which together provide broad foundational preparation for further study in the biological sciences.
Corequisite: Bi 215.

## Bi 213 - Principles of Biology: Evolution and ecology of living organisms (4)

Study of the evolution and ecology of living organisms. Specific topics include natural selection, speciation, the introduction of major phyla, and ecology. Four hours lecture. This is one of sixcourses ( $\mathrm{Bi} 211-6$ ), which together provide broad foundational preparation for further study in the biological sciences.
Corequisite: Bi 216.

## Bi 214 - Principles of Biology Lab I (1)

Laboratory work to accompany Principles of Biology I (Bi 211). Completion of, or concurrent enrollment in the appropriate lecture course is required. One 3-hour laboratory. Graded only.
Corequisite: Bi 211.

## Bi 215 - Principles of Biology Lab II (1)

Laboratory work to accompany Principles of Biology II (Bi 212). Completion of, or concurrent enrollment in the appropriate lecture course is required. One 3-hour laboratory. Graded only.
Corequisite: Bi 212.

## Bi 216 - Principles of Biology Lab III (1)

Laboratory work to accompany Principles of Biology III (Bi 213). Completion of, or concurrent enrollment in the appropriate lecture course is required. One 3-hour laboratory. Graded only.
Corequisite: Bi 213.

## Bi 234 -Elementary Microbiology (4)

Introduction to the basic and applied aspects of microbiology, with special emphasis on the role of microorganisms in human affairs. Such fields as nursing, environmental protection, food technology, and public health are given special attention. Topics will include microbial growth and death, human disease, environmental microbiology, food and industrial microbiology, microbial as pects of water and sewage treatment, aspects of microbial gene flow, genetic engineering, and vaccine development.

## Bi 235 -Microbiology Laboratory (2)

The laboratory is designed for science majors and others who need practical experience in culturing and observation of microorganisms. Topics will include culture techniques, use of the microscope for observation of microorg anisms, and procedures for study of microorganis ms in the laboratory and field. Two 2-hour laboratory periods.

## Bi 299 -Special Studies (1-8)

See department for course description. (Credit to be arranged.)

## Bi 301 - Human Anatomy and Physiology (4)

Microanatomy, macroanatomy, genetics, embryology, and physiology. Comprehensive understanding of man as a functionally integrated biological entity. One 3-hour laboratory. This is the first course in a sequence of three:
Bi 301, Bi 302, and Bi 303. Expected preparation: One year of college biological science; for BI 302 : Completion of BI 301 with C- or above; for BI 303: Completion of BI 302 with a C- or above.
Prerequis ite: Prior completion (with a C - orhigher) of either Bi 207 Allied Health or Data Bi 211 Principles of

Biology. Prerequisite cannot be taken concurrently. Corequisite: Bi 301L.

Bi301L - Human Anatomy and Physiology Lab (0)
Lab for Bi 301.
Corequisite: Bi 301.

## Bi 302 - Human Anatomy and Physiology (4)

Microanatomy, macroanatomy, genetics, embryology, and physiology. Comprehensive understanding of man as a functionally integrated biological entity. One 3-hour laboratory. This is the second course in a sequence of three: $\mathrm{Bi} 301, \mathrm{Bi} 302$, and Bi 303.

Prerequisite: Prior completion of Bi 301 with a C - or higher. Corequisite: Bi 302L.

## Bi 302L - Human Anatomy and Physiology Lab (0)

Lab for Bi 302.
Corequisite: Bi 302.

## Bi 303 - Human Anatomy and Physiology (4)

Microanatomy, macroanatomy, genetics, embryology, and physiology. Comprehensive understanding of man as a functionally integrated biological entity. One 3-hour laboratory. This is the third course in a sequence of three: Bi 301, Bi 302, and Bi 303.

Prerequisite: Prior completion of Bi 302 with a C - or higher. Corequisite: Bi 303L.
Bi 303L - Human Anatomy and Physiology Lab (0)
Lab for Bi 303.
Corequisite: Bi 303.
Bi 320 - Introduction to Organismal Physiology (4)
An overview of fundamental principles of physiology. Course covers the physical and chemical mechanisms res ponsible for how animals, plants and microbes function.

Prerequisite: Priorcompletion of $\mathrm{Bi} 211, \mathrm{Bi} 212$, and Bi 213 with a C- or above.

## Bi 326 - Comparative Vertebrate Embryology (5)

Comparative study of the development of representative vertebrates, including the cellular mechanis ms res ponsible for early morphogenesis. One 4-hour laboratory period.
Prerequisite: Completion of Bi 211, Bi 212, and Bi 213 with C- or above in each section. Corequisite: Bi 326L.

## Bi 326L - Vertebrate Embryology Lab (0)

Lab for Bi 326.
Corequisite: Bi 326 .

## Bi 328 - Comparative Vertebrate Anatomy (5)

Gross dissection and comparison of organ systems in representative vertebrateforms. Two 4-hour laboratory periods.
Prerequisite: Completion of $\operatorname{Bi} 212$ with a C-or above. Corequisite: Bi 328L.

## Bi 328L - Comparative Vertebrate Anatomy Lab (0-1)

Lab for Bi 328.
Corequisite: Bi 328 .

## Bi 330 - Introduction to Plant Biology (4)

Plant diversity, structure and function in relationship to evolution, habitat, and interactions with other organisms. Historical impacts of plants on human culture, including conservation, biotechnology, and world food supply.

Prerequisite: Completion of Bi 211 , Bi 212 , and Bi 213 with C- or above in each section.

## Bi 334 -Molecular Biology (4)

The principles, concepts and methods of molecular biology focusing on structure, biochemistry, biosynthesis, and regulation of cellular macromolecules-DNA, RNA, and proteins. Topics covered include the nature, structure, regulation and expression of genes, molecular aspects and regulation of translation, DNA replacation and repair, mutagenesis, and an introduction to molecular techniques.
Prerequisite: Completion of $\operatorname{Bi} 211$ with a C-or above.

## Bi 336 - Cell Biology (5)

Biology of eukaryotic (plant/animal) and prokary otic cells (bacteria, etc.) with emphasis on physiology, biochemistry, morphology, and energetic. Four hours of lecture and one hour of recitation. Expected preparation: BI 334 Molecular.

Corequisite: Bi 336R.

## Bi 336R - Cell Biology Recitation (0)

Recitation for Bi 336.
Corequisite: Bi 336.

## Bi 337 - Cell Biology Laboratory (1)

Experiments in cell biology to complement lecture. One three-hour laboratory. Recommended prerequisite: prior completion of/or concurrent enrollment in Bi 336.

## Bi 341 - Introduction to Genetics (4)

The mechanismof biological inheritance. One 2-hour recitation period.
Prerequisite: Completion of Bi 211 with a C-or above. Corequisite: Bi 341R.

## Bi341R - Introduction to Genetics Recitation (0)

Recitation for Bi 341.
Corequisite: Bi 341.

## Bi 346U - Genes and Society (4)

Explores the principles of genetics, molecular biology, and biotechnology within social and his torical context. Emphas is on the ethical is sues arising fromthe intersection of genetics, technology, and society, with attention to the role of gender, race, and class in the formation and application of scientific knowledge. This is the same course as WS 346 U and may be taken only once for credit.
Cross-Listed as: WS 346U.

## Bi 357 - General Ecology (4)

The interrelationships of plants and animals with their environments. Emphas is is on basic ecological principles and concepts, not on current en vironmental problems.
Prerequisite: $\operatorname{Bi} 211, \operatorname{Bi} 212$, $\operatorname{Bi} 213$ with a C- or above in each section.

## Bi 358 - Evolution (4)

Examination of processes underlying evolutionary change and patterns of biodiversity generated by these processes. Introduction to elementary population genetics, quantitative genetics, and phylogenetics. Emphasizes methods of reasoning and experimentation used in evolutionary res earch. Expected preparation: Bi 341.
Prerequisite: Completion of $\operatorname{Bi} 211$, $\operatorname{Bi} 212$, $\operatorname{Bi} 213$ with a C- or above.

## Bi 360 - Introduction to Marine Biology (3)

The marine environment and its life forms. Survey of organis mal diversity with emphasis on structural and physiologicaladaptations to the marine realm.

Prerequisite: Completion of Bi 211, Bi 212, Bi 213 with a C- or above in each section.
Bi 361 - Introduction to Marine Biology Laboratory (1)
Laboratory and field work in marine biology. One 3-hour laboratory period. Recommended prerequisite: completion of or concurrent enrollment in Bi 360.

## Bi 370 - Mushrooms (4)

An introduction to the distribution, systematics, identification, ecology, morphology, and life histories of vis ible fungi (mushrooms). Two 3-hour laboratory periods; field trips.

Prerequisite: Successful completion of the Principles of Biology sequence ( $\operatorname{Bi} 211$, Bi 212, Bi 213, Bi 214, Bi 215, Bi 216) with a C- or higher. Corequisite: Bi 370 L .

## Bi370L-Mushrooms Lab (0)

Lab for Bi 370 Mushrooms.
Corequisite: Bi 370.

## Bi 380 - Microbiology (4)

Fundamental concepts and techniques of microbiology. The general principles of microbial cell structure and function, physiology and biochemistry, growth, survival, classification, and diversity are emphasized.
Prerequisite: Prior completion of any of the following: Bi 334 Molecular, Bi 336 Cell, or Bi 341 Genetics with a Cor higher. Prerequisite cannot be taken concurrently.

## Bi 386 -Invertebrate Zoology (6)

Invertebrate animal diversity, with a focus on species of the Pacific Northwest. Emphasis on evolution of adaptations in anatomy, physiology, and behavior. Two 2hour lectures, one 3-hour laboratory, with some field trips outside of class time.
Prerequisite: Completion of $\operatorname{Bi} 211$, $\operatorname{Bi} 212$, Bi 213 with a C- or above. Corequisite: Bi 386L.
Bi 386L - Invertebrate Zoology Lab (0)
Lab for Bi 386.
Corequisite: Bi 386.

## Bi 387 - Vertebrate Zoology (6)

Classification, anatomical characteristics, distribution, and life habits of fishes, amphibians, reptiles, birds, and mammals. Two 2-hour lectures, one 3-hour laboratory.
Prerequisite: Completion of $\operatorname{Bi} 211$, Bi 212, Bi 213 with a C- or above in each section. Corequisite: Bi 387 L .

## Bi 387L - Vertebrate Zoology Lab (0)

Lab for Bi 387.

## Bi 388 -Microbiology Techniques (2)

Techniques in microbiology, including staining and microscopy, isolation and maintenanceofbacteria, counting techniques, and methods for a wide range of physiological and morphological tests.
Prerequisite: $\operatorname{Bi} 235$, or $\operatorname{Bi} 337$, or consent of instructor.

## Bi 399 -Special Studies (0-6)

See department for course description. (Credit to be arranged.)

## Bi 401 - Research (0-6)

See department for course description. (Credit to be arranged.)

## Bi 402 - Independent Study (1-6)

(Credit to be arranged.)

## Bi 403 - Thesis (1-6)

(Credit to be arranged.)

## Bi 404 - Cooperative Education/internship (1-12)

See department for course description. (Credit to be arranged.)

## Bi 405 - Reading and Conference (0-6)

See department for course description. (Credit to be arranged.)

## Bi 406-Laboratory Project(1-6)

See department for course description. (Credit to be arranged.)

## Bi 407 -Seminar (1-6)

Selected topics in biology. (Credit to be arranged.)

## Bi 409 - Practicum (1-12)

(Credit to be arranged.)

## Bi 410 -SelectedTopics (0-12)

Consentof instructor. See department for course description. (Credit to be arranged.)

## Bi 410L -SelectedTopics Lab (0)

Consent of instructor. See department for course description. (Credit to be arranged.)

## Bi 412 -Animal Behavior (4)

An evolutionary approach to the study of animal behavior. The importance of ecological, phy siological, and social variables will be examined in relation to the behavior of the individual animal. Expected preparation:upperdivision standing.

Also offered for graduate-level credit as Bi 512 and may be taken only once for credit. . Prerequisite: Completion of Bi 211, Bi 212, Bi 213 with a C - or above in each section.

## Bi 413 -Herpetology (6)

Distinguishing features, anatomy, physiology, origins, evolution, and ecology of amphibians and reptiles. North American species are emphasized. Two 2-hour lectures, two 2-hour laboratories.

Prerequisite: Completion of Bi 211, Bi 212, Bi 213 with a C- or above in each section. Corequis ite: Bi 413 L .

## Bi 413L-Herpetology Lab (0)

Lab for Bi 413 Herpetology.
Corequisite: Bi 413.

## Bi414-Ornithology (6)

Evolution, diversity, ecology, physiology, and behaviorof birds. One 3-hour laboratory. Laboratory emphasizes species identification andexposes students to techniques used in museumand field studies. Students conducta research project outside of scheduled laboratory time.

Prerequisite: Completion of Bi 211, Bi 212, Bi 213 with a C- or above. Corequisite: Bi 414L.

## Bi 414L-Ornithology Lab (0)

Lab for Bi 414 Ornithology.
Corequisite: Bi 414.

## Bi 415 -Mammalogy (6)

Diversity, characteristics, evolution, structure, function, distribution, and life habits of mammals. North American species are emphasized. Two 2-hour lectures, two 2-hour laboratories.
Prerequisite: Completion of Bi 211, Bi 212, Bi 213 with a C- or above in each section. Corequisite: Bi 415 L .
Bi 415L-Mammal Lab (0)
Lab for Bi 415 Mamalogy.
Corequisite: Bi 415 .

## Bi 416 - Marine Mammals (6)

Study of the distinguishing features, classification, origins, evolution, physiology, anatomy, behavior, ecology, and status of groups of marine mammals. Two 2-hour lectures, two 3-hour laboratories.

Also offered for graduate-level credit as Bi 516 and may be taken only once for credit. .Prerequisite: Bi 387 or Bi 415 . Corequisite: Bi416L.
Bi 416L-Marine Mammal Lab (0)
Lab for Bi 416 Marine Mammals.

Corequisite: $\operatorname{Bi} 416$.

## Bi 417 - Mammalian Physiology (4)

Phys iology of the mammalian cardiovascular, respiratory, renal and digestive systems with emphasis on homeostatic control and integration of theses ystems in normal and pathophysiological states.

Also offered for graduate-level credit as Bi 517 and may be taken only once for credit. . Prerequisite: Completion of Bi 320 with a C- or above.

## Bi 418 - Comparative Animal Physiology (4)

Phys iology of metabolic, res piratory, circulatory, excretory, muscle, and nervous systems with emphasis on a comparative ecological approach.
Also offered for graduate-level credit as Bi 518 and may be taken only once for credit. . Prerequisite: Completion of Bi 320 with a C- or above.

## Bi 419 - Animal Physiology Laboratory (4)

Laboratory experiments on the physiology of animals from the cell through organismic levels. Two 3.5-hour laboratory periods.
Also offered for graduate-levelcredit as $\operatorname{Bi} 519$ and may be taken only once for credit. . Prerequisite: Completion of Bi 211, Bi 212, Bi 213 with a C- or above.

## Bi 421 - Virology (4)

Classification, structure, genetics, molecular biology of replication, cell interactions, and host response of representative groups of bacterial, plant, and animal viruses, and the medical as pects of important human viruses. Expected preparation: Bi 336.
Also offered for graduate-level credit as Bi 521 and may be taken only once for credit. . Prerequisite: Bi 334 with a Cor above.

## Bi 423 - Microbial Ecology (4)

Study of the interaction of microorganisms with each other and plants and animals; soil and aquatic systems; microbial evolution; cycles of matter; biodegradation and microbial pest control.
Also offered for graduate-level credit as Bi 523 and may be taken only once for credit. Prerequisite: Bi 380.

## Bi 424 - Molecular Genetics (4)

The nature of the gene and its mode of action, org anization of the genetic material, and the regulation of gene action.
Also offered for graduate-level credit as Bi 524 and may be taken only once for credit. . Prerequisite: Bi 334.

## Bi 425 - Natural History of Antarctica (5)

Evolution and systematics of the Antarctic and subAntarctic flora and fauna, physiological adaptation to an extreme environment, conservation concerns and the history of exploration and exploitation of the Antarctic region.

Also offered for graduate-level credit as Bi 525 and may be taken only once for credit. . Prerequisite: Completion of Bi 211, Bi 212, Bi 213 with a C- or above. Corequisite: Bi 425L.

## Bi 425L - Natural History of Antarctica Lab (0)

Lab for Bi 425.
Corequisite: Bi 425.

## Bi 426 - Advanced Topics in Evolutionary Biology (3)

Lectures and discussions on advanced topics in evolutionary biology; evaluation of historical and current trends in this field.
Also offered for graduate-level credit as Bi 526 and may be taken only once for credit. Prerequisite: Bi 358 or equivalent (course must be passed with a minimum of a B).

## Bi 427 -Evolutionary Genomics (4)

An introduction to theory used in population genetics and genomics, and application of evolutionary principles through computer exercises and simulations. Examination and application of techniques for the analysis of genetic and genomic data using the R programming language.
Also offered for graduate-level credit as Bi 527 and may be taken only once for credit. . Prerequisite: Bi 341 and Bi 358.

## Bi 428 -Human Genetics (4)

The org anization of the human genome, pedigree analysis, gene mapping, chromosome abnormalities, sex determination, and gene defects (metabolic and hemoglobin). Topics are discussed fromthe point of view of clinical applications and current research.

Also offered for graduate-level credit as Bi 528 and may be taken only once for credit. . Prerequis ite: Bi 341.

## Bi 429 - Conservation Biology (4)

Examination of the principles of conservation biology and applications of theory to conservation is sues, globally and in the Northwest. Expected preparation: Bi 341, Bi 357, Bi 387, Bi 426.
Also offered for graduate-level credit as Bi 529 and may be taken only once for credit. .

## Bi 430 - Theory of Recombinant DNA Techniques (4)

Lectures on the principles and theory of recombinant DNA and molecular cloning techniques. Topics will cover use of
restriction and other DNA modifying enzymes, host-vector systems, DNA fragment and plasmid isolation techniques, gene mapping, subcloning techniques, in vitro mutagenesis, cDNA and genomic cloning, screening of clones, blot hybridizations, DNA transfection and use of reporter genes, DNA sequencing andPCR.

Also offered for graduate-level credit as Bi 530 and may be taken only once for credit. . Prerequis ite: Bi 334.

## Bi 431 - Advanced Molecular and Cell Biology Research Laboratory (2)

Laboratory using recombinant DNA and molecular cloning techniques applied to current research projects.
Presentations and discussions of scientific literature.
Also offered for graduate-level credit as Bi 531 and may be taken only once for credit. . Prerequisite: Bi 334; Bi 235 or Bi 337.

## Bi 432 - Plant Diversity and Evolution (5)

Study of the morphology, structure, and life history of green algae, bryophytes, and vascular plants froman evolutionary point of view. Two 2-hour lectures and one 3hour laboratory.
Also offered for graduate-level credit as Bi 532 and may be taken only once for credit. . Prerequisite: Bi341 and Bi 358. Corequisite: Bi 432 L .

Bi 432L - Lab for Bi 432 (0)
Lab for Bi 432.
Corequisite: Bi 432.

## Bi 433 - Morphology of Vascular Plants (4)

Study of the gross morphology, development, and structure of roots, stems, leaves, and flowers froman evolutionary point of view. One 3-hour laboratory.
Also offered for graduate-level credit as Bi 533 and may be taken only once for credit. . Prerequisite: Completion of Bi 211, Bi 212, Bi 213 with a C- or above.

## Bi 434 - Plant Anatomy (5)

Structure of meristems, cells, tis sues, and tissue systems or roots, stems, leaves, flowers and fruits from the developmental and comparative standpoint. One 3-hour laboratory.

Also offered for graduate-level credit as Bi 534 and may be taken only onceforcredit. .Prerequisite: Completion of Bi 211 , Bi 212, Bi 213 with a C- or above.

## Bi 434L - Plant Anatomy Lab (0)

Lab for Plant Anatomy

## Bi 435 - Plant Systematics (4)

Angiospermclassification, diversity, and evolutionary relationships. Methods of phylogenetic analysis and current hypotheses regarding angiospermphylogeny are emphasized. Lab will focus on the formand floral structure of about 30 local plant families. One 3-hour laboratory.

Also offered for graduate-level credit as Bi 535 and may be taken only once for credit. . Prerequisite: Completion of Bi 211, Bi 212, Bi 213 with a C- or above. Corequisite: Bi 435L.

## Bi 435L-Plant Systematics Lab(0)

Lab for Bi 435.
Corequisite: Bi 435 .

## Bi 436 - Behavioral Endocrinology (4)

Comparative examination of the major hormone systems that regulate behavior across the animal kingdom. Emphasizes the reciprocating nature of hormone and behavior interactions and seeks to understand how natural selection drives the evolution of hormone structure and function.
Also offered for graduate-level credit as Bi 536 and may be taken only once for credit. . Prerequisite: Completion of Bi 320 with a C- or above.

## Bi 437 -Physiological Adaptations to Extreme Environments (3)

Cellular, biochemical and physiological adaptations that allow animals to thrive in the Earth's harshest habitats with a focus on what makes species fromextreme environments unique.
Also offered for graduate-level credit as $\operatorname{Bi} 537$ and may be taken only once for credit. Prerequisite: Completion of Bi 320 with a C- orabove.

## Bi 438 -Plant Chemical Biology (3)

Covers the diversity and function of chemical plant traits and their impact on plant-associated organisms. Students will learn about groups of compounds, their regulation, effects and potential applications and will gain an understanding of how different plant traits functionally interact including positive (defense syndromes) and negative (tradeoffs) as sociations. Prior completion of Bi 330 recommended.
Prerequisite: Bi 211 and $\operatorname{Bi} 212$.

## Bi 440 - Evolutionary Medicine (4)

An introduction toevolutionary thinking as it applies to human diseases, traits, diet, and aging. Concepts in evolutionary theory will provide a framework for understanding the ultimate causes of human ailments. Expected preparation: Bi 358 .

Also offered for graduate-level credit as $\operatorname{Bi} 540$ and may be taken only once for credit. Prerequisite: One year of introductory biology.

## Bi 441 - Plant Physiology (5)

Metabolic activities of plants. Two 3-hour laboratory periods. Expected preparation: Bi 320 . Co-requisite: Bi 441L.

Also offered for graduate-level credit as Bi 541 and may be taken only once for credit. . Prerequis ite: Completion of Bi 211, Bi 212, Bi 213 with a C- or above. Corequisite: Bi 441L.

## Bi 441L - Plant Physiology Lab (0)

Lab for Bi 441.
Corequisite: $\operatorname{Bi} 441$.

## Bi 442 - Plant Physiology (3)

Biochemical activities of plants, photosynthesis, and respiration. Course is intended to be taken in sequence with Bi 441 . Expected preparation: Bi 441.

Also offered for graduate-level credit as Bi 542 and may be taken only once for credit. .

## Bi 447 -Scientific Teaching (4)

Designed for upper-division science majors and graduate students interested in learning about best practices in teaching and learning science. In this interactive course students will gain experience in curriculumdesign and delivery as well as engage with education research literature.

Also offered for graduate-level credit as Bi 547 and may be taken only once for credit. Prerequisite: Upper-division standing.

## Bi 450 - Phylogenetic Biology (4)

The history of life's divers ification through the useof phylogenetic trees, with a focus on how genes, organisms, and traits have evolved. Includes hands-on computer analyses of DNA sequences.
Also offered for graduate-level credit as Bi 550 and may be taken only once for credit. . Prerequisite: Bi 358 with a Cor above, or concurrent enrollment in Bi 358.

## Bi 452 - Cancer Biology (4)

Provides the fundamentals of cancer biology. Topics include: altered membrane receptor and cytoplasmic signaling; altered cell: cell interactions; dy sregulated cell cycle, apoptosis, and senescence; angiogenesis; and altered cellular adhesion. Expected preparation: one quarter of Organic Chemrecommended.

Also offered for graduate-level credit as Bi 552 and may be taken only once for credit. Prerequisite: Bi 334, Bi 336, Bi 341.

## Bi 453 - Biology of Aging (3)

The study of molecular and structural changes in animals as a function of age. Emphasis is on the basic biological factors which limit life-span. Recommended prerequisites: Bi 336 or biochemistry, Bi 487 .

## Bi 455 -Histology (6)

Systemic study, description, and identification of histological structures. Two 3-hour laboratory periods.
Also offered for graduate-level credit as Bi 555 and may be taken only once for credit. . Prerequisite: Completion of Bi $211, \mathrm{Bi} 212$, and Bi 213 with a C- or above and Bi 320 or Bi 336 with a C- or above. Corequisite: Bi 455 L .

## Bi 455L - Histology Lab (0)

Lab for Bi 455.
Corequisite: Bi 455.

## Bi 456 -Developmental Biology (4)

Explores basic principles of how org anisms develop froma fertilized egg into a complex, multicellular adult. Focuses on contemporary is sues in developmental biology, including pattern formation, morphogenesis, determination, and differentiation in vertebrates and invertebrates.

Also offered for graduate-level credit as Bi 556 and may be taken only once for credit. Prerequisite: Bi 336 and Bi 341.

## Bi 460 - Marine Biology of the DeepSea (4)

The deep seais the largest, but least well-known, living space on the planet. This upper-division Biology majors course provides students with in-depth knowledge of deep sea, its inhabitants and their diverse life his tory strategies, and the anthropogenic factors shaping the deep sea as we know it. Clas ses will alternate between lectures and student-led discussions. Students will be expected to have knowledge of general biology prior to the start of the course.
Prerequisite: $\operatorname{Bi} 211$, Bi 212 , and $\operatorname{Bi} 213$. Concurrent enrollment is allowed only for Bi 213.

## Bi 462 - Cellular Neuroscience (4)

Presents a study of the sophisticated electrical and chemical signals used by cells of the brain to coordinate and disseminate information about the body and its environment. This working knowledge of the cellularand molecular biology of neurons will serve as the foundation for the understanding of activity dependent circuit formation and brain development.

Also offered for graduate-level credit as Bi 562 and may be taken only once for credit. . Prerequis ite: Completion of Bi 320 with a C- or above or concurrent enrollment.

## Bi 463 - Systems Neuroscience (4)

Explores movement and the mechanisms by which organis ms transduce, encode, and ultimately perceive information from both theexternal and internal environment. Topics: Touch and Proprioception, Pain, Vision, Auditory System, VestibularSystem, Chemical Senses, Lower Motor Neuron Circuits and Motor Control, Upper Motor Neuron Control of the Brainstemand Spinal Cord, Modulation of Movement by the Basal Gang lia, Modulation of Movement by the Cerebellum, Visceral Motor System. Expected preparation: Bi 462.
Also offered for graduate-level credit as Bi 563 and may be taken only once for credit. . Prerequis ite: Completion of Bi 320 with a C- or above.

## Bi 471 - Plant Ecology (4)

A study of the interrelationships between plants and their environment with emphasis upon individual adaptation and community dy namics. One 3-hour laboratory period.
Also offered for graduate-level credit as Bi 571 and may be taken only once forcredit. . Prerequisite: Bi 357.
Corequisite: Bi471L.

## Bi 471L - Plant Ecology Lab (0)

Lab for Bi 471.
Corequisite: Bi 471.

## Bi 472 - Natural History (3)

A study of plant and animal interrelationships, emphasizing maintenance of properfield records, identification, distribution, and ecology of vertebrates in Oregon. Includes one two-hour laboratory.

Also offered for graduate-level credit as Bi 572 and may be taken only once for credit. . Prerequisite: Completion of Bi 211, Bi 212, Bi 213 with a C- or above. Corequisite: Bi 472L.

## Bi 472L - Lab for Bi 472 (0)

Lab for Bi 472.
Corequisite: $\operatorname{Bi} 472$.

## Bi 473 - Field Sampling (4)

The methods commonly employed for collecting and interpreting ecological data. One 3-hour laboratory.
Also offered for graduate-level credit as Bi 573 and may be taken only once for credit. . Prerequisite: Completion of Bi 211, Bi 212, Bi 213 with a C- or above.

## Bi 476 - Population Ecology (5)

Course is designed to explore methods to describe population growth and dynamics of plants and animals. The theoretical foundation for the evolution of life histories will be explored, along with analysis of the influence of inters pecific interactions on population processes. Larger landscape-level questions will be addressed by examining populations from the framework of source-sink dynamics, ecological traps, and metapopulations.
Also offered for graduate-level credit as Bi 576 and may be taken only once for credit. . Prerequis ite: Bi 357.

## Bi 476L - Population Ecology Lab (0)

Lab for Bi 476.

## Bi 478 - Terrestrial Community Ecology (3)

Study of how plant, animal, and microbial communities are as sembled across time and space. Emphasis will include understanding interactions among species and thecauses of biological diversity in terrestrial systems.
Also offered for graduate-level credit as Bi 578 and may be taken only once for credit. Prerequisite: Bi 357.

## Bi 479 - Plant Reproductive Biology (5)

Covers the diversity processes and functions of sexual and asexual reproduction of plants. Students will learn about pollination, anatomy, morphology, and physiology of plant reproduction. They will develop an understanding of how biological processes contribute to the ecology and evolution of veget ative growth and flowering. Three hours of lecture and 5 hours of lab per week; there are 2 mandatory field trips.

Also offered for graduate-level credit as Bi 579 and may be taken only once for credit. Prerequisite: Successful completion of Bi 330 with a C - or better.

## Bi 481 -Microbial Physiology (3)

Physiology and biochemistry of microorganisms. Modern contributions to microbiology emphasized. Micro- and macro-molecular anatomy of microbial cells; energy metabolism, bios ynthetic pathways and their regulation, kinetic and molecular as pects of growth, genetics, evolution, and ecology.
Also offered for graduate-level credit as Bi 581 and may be taken only once for credit. . Prerequisite: Completion of Bi 211, Bi 212, Bi 213 with a C- or above.

## Bi 486 -Pathogenic Bacteriology (4)

Study of bacteria pathogenic to humans and their relationship to infectious disease. Emphasis on the biochemical mechanismof infection and laboratory diagnosis.

Also offered for graduate-level credit as Bi 586 and may be taken only once for credit. . Prerequisite: Bi 380.

## Bi 487 - Immunology and Serology (4)

Topics include the tis sues and cells of the immune system, discrimination between self versus foreign antigen, the structure, function and genetics of antigen receptors, components and coordination between innate and adaptive responses, and disease res ponse and susceptibility.
Also offered for graduate-levelcredit as Bi 587 and may be taken only once for credit. . Prerequisite: Completion of Bi 334 and Bi 336 with a C- or above.

Bi 489 - Microbiology Physiology Laboratory (1)
Application of the principles of microbiology in the laboratory. One 3-hour laboratory period. Expected preparation: concurrent with $\mathrm{Bi} 481 / 581$.

Also offered for graduate-level credit as Bi 589 and may be taken only once for credit. .

## Bi 501 - Research (0-12)

See department for course description. (Credit to be arranged.)

## Bi 502 - Independent Study (1-6)

(Credit to be arranged.)

## Bi 503 - Thesis (0-12)

See department for course description. (Credit to be arranged.)

## Bi 504 - Cooperative Education/internship (1-9)

See department for course description. (Credit to be arranged.)

## Bi 505 - Reading and Conference (0-12)

See department for course description. (Credit to be arranged.)

## Bi 506 -Special Projects (1-8)

See department for course description. (Credit to be arranged.)

## Bi 507 - Seminar (1-6)

Selected topics in biology. (Credit to be arranged.)

## Bi 509 -Practicum(1-9)

(Credit to be arranged.)

## Bi 510 -SelectedTopics (0-6)

Consent of instructor. See department for course description. (Credit to be arranged.)

## Bi 510L - Selected Topics Lab (0)

Consent of instructor. See department for course description. (Credit to be arranged.)

## Bi 512 - Animal Behavior (4)

An evolutionary approach to the study of animal behavior. The importance of ecological, physiological, and social variables will be examined in relation to the behavior of the individual animal. Expected preparation: one year of introductory biology and upper-division standing.

Also offered for undergraduate-level credit as Bi 412 and may be taken only once for credit. .

## Bi 513 - Herpetology (6)

Distinguishing features, anatomy, physiology, origins, evolution, and ecology of amphibians and reptiles. North American species are emphasized. Two 2-hour lectures, two 2-hour laboratories.

## Bi 514 - Ornithology (6)

Evolution, diversity, ecology, physiology, and behavior of birds. One 3-hour laboratory. Laboratory emphasizes species identification and exposes students to techniques used in museumand field studies. Students conduct a research project outside of scheduled laboratory time.
Corequisite: Bi 514L.

## Bi 514L - Ornithology Lab (0)

Lab for Bi 514.
Corequisite: Bi 514.

## Bi 515 -Mammalogy (6)

Diversity, characteristics, evolution, structure, function, distribution, and life habits of mammals. North American species are emphasized. Two 2-hour lectures, two 2-hour laboratories.
Corequisite: Bi 515L.

## Bi 515L-Mammal Lab (0)

Lab for Bi 515.
Corequisite: Bi 515.

## Bi 516 - Marine Mammals (6)

Study of the distinguishing features, classification, origins, evolution, physiology, anatomy, behavior, ecology, and status of groups of marine mammals. Two 2-hour lectures, two 3-hour laboratories.
Also offered for undergraduate-levelcredit as Bi 416 and may be taken only once for credit. . Prerequisite: Bi 387 or Bi 415. Corequisite: Bi 516L.

## Bi 516L - Marine Mammal Lab (0)

Lab for Bi 516.
Corequisite: Bi 516.

## Bi 517 - Mammalian Physiology (4)

Physiology of the mammalian cardiovascular, respiratory, renal and digestive systems with emphasis on homeostatic control and integration of thesesystems in normal and pathophysiological states.
Also offered for undergraduate-levelcredit as Bi 417 and may be taken only once for credit.

## Bi 518 - Comparative Animal Physiology (4)

Physiology of metabolic, res piratory, circulatory, excretory, muscle, and nervous systems with emphasis on a comparative ecological approach.
Also offered for undergraduate-levelcredit as Bi 418 and may be taken only once for credit.

## Bi 519 - Animal Physiology Laboratory (4)

Laboratory experiments on the phy siology of animals from the cell through organismic levels. Two 3.5-hour laboratory periods.

Also offered for undergraduate-levelcredit as Bi 419 and may be taken only once for credit.

## Bi 520 - Ethical Practice in the Life Sciences (3)

Addresses is sues pertaining to the ethical and responsible conduct of scientific research, including role of research in society; biosafety; human and animal subjects and welfare; funding, conflict of interest, and intellectual property; publication and peer review; and fraud, bias and mis conduct. Satisfies NSF and NIH requirements for research ethics training. Open to graduate students in Biology, Chemistry, and EnvironmentalSciences. Post-bac students not currently enrolled in a graduate programmay take this course with departmental approval.

## Bi 521 - Virology (4)

Clas sification, structure, genetics, molecular biology of replication, cell interactions, and host response of representative groups of bacterial, plant, and animal viruses, and the medical as pects of important human viruses.

Also offered for undergraduate-level credit as Bi 421 and may be taken only once for credit.

## Bi 522 -Bioinformatics and Genomics (3)

Introduction to computational tools and databases that enable genome-scale research.

Also offered for undergraduate-level credit as Bi 422 and may be taken only once for credit. Prerequisite: Complete Bi 334: Molecular Biology with C- or better.

## Bi 523 -Microbial Ecology (4)

Study of the interaction of microorg anisms with each other and plants and animals; soil and aquatic systems; microbial evolution; cycles of matter; biodegradation and microbial pest control.

Also offered for undergraduate-level credit as Bi 423 and may be taken only once for credit.

## Bi 524 -Molecular Genetics (4)

The nature of the gene and its mode of action, org anization of the genetic material, and the regulation of gene action.
Also offered for undergraduate-level credit as Bi 424 and may be taken only once for credit.

## Bi 525 - Natural History of Antarctica (5)

Evolution and systematics of the Antarctic and subAntarctic flora and fauna, physiological adaptation to an extreme environment, conservation concerns and the history of exploration and exploitation of the Antarctic region.

Also offered for undergraduate-level credit as Bi 425 and may be taken only once for credit. Corequisite: Bi 525 L .

## Bi 525L - Natural History of AntarcticaLab (0)

Lab for Bi 525.
Corequisite: Bi 525.

## Bi 526 - Advanced Topics in Evolutionary Biology (3)

Lectures and discussions on advanced topics in evolutionary biology; evaluation of historical and current trends in this field. Expected preparation: Bi 358 or equivalent.
Also offered for undergraduate-level credit as Bi 426 and may be taken only once for credit.

## Bi 527 - Evolutionary Genomics (4)

An introduction to theory used in population genetics and genomics, and application of evolutionary principles through computer exercises and simulations. Examination and application of techniques for the analysis of genetic and genomic data using the R programming language.

Also offered for undergraduate-levelcredit as Bi 427 and may be taken only once for credit. . Prerequisite: Bi 341 and Bi 358.

## Bi 528 - Human Genetics (4)

The organization of the human genome, pedigree analysis, gene mapping, chromosome abnormalities, sex determination, and gene defects (metabolic and hemoglobin). Topics are discussed fromthe point of view of clinical applications and current research.

Also offered for undergraduate-levelcredit as Bi 428 and may be taken only once for credit. . Prerequis ite: Bi 341.

## Bi 529 - Conservation Biology (4)

Examination of the principles of conservation biology and applications of theory to conservation is sues, globally and in the Northwest. Expected preparation: Bi 341, Bi 357, Bi 387, Bi 426.

Also offered for undergraduate-levelcredit as Bi 429 and may be taken only once for credit. .

## Bi 530 - Theory of Recombinant DNA Techniques (4)

Lectures on the principles and theory of recombinant DNA and molecular cloning techniques. Topics will cover use of restriction and other DNA modifying enzymes, host-vector systems, DNA fragment and plas mid is olation techniques, gene mapping, subcloning techniques, in vitro mutagenesis, cDNA and genomic cloning, screening of clones, blot hybridizations, DNA transfection and use of reporter genes, DNA sequencing andPCR.
Also offered for undergraduate-levelcredit as Bi 430 and may be taken only once for credit. . Prerequisite: Bi 334.

## Bi 531 - Advanced Molecular and Cell Biology Research Laboratory (2)

Laboratory using recombinant DNA and molecular cloning techniques applied to current research projects.
Presentations and discussions of scientific literature.
Also offered for undergraduate-levelcredit as Bi 431 and may be taken only once for credit. . Prerequisite: Bi 334; Bi 235 or Bi 337.

## Bi 532 - Plant Diversity and Evolution (5)

Study of the morphology, structure, and life history of green algae, bryophytes, and vascular plants froman evolutionary point of view. Two 2-hour lectures and one 3hour laboratory.

Also offered for undergraduate-level credit as Bi432 and may be taken only once for credit. Corequisite: Bi 532 L .

Bi 532L-Lab for Bi 532 (0)
Lab for Bi 532.
Corequisite: Bi 532.

## Bi 533 - Morphology of Vascular Plants (4)

Study of the gross morphology, development, and structure of roots, stems, leaves, and flowers froman evolutionary point of view. One 3-hour laboratory.
Also offered for undergraduate-level credit as Bi 433 and may be taken only once for credit.

## Bi 534 -Plant Anatomy (5)

Structure of meristems, cells, tis sues, and tissue systems or roots, stems, leaves, flowers and fruits fromthe developmental and comparative standpoint. One 3-hour laboratory.
Also offered for undergraduate-level credit as Bi 434 and may be taken only once for credit.
Bi 534L - Plant Anatomy Lab (0)
Lab for Bi 534 Plant Anatomy.

## Bi 535 - Plant Systematics (4)

Angiospermclassification, diversity, and evolutionary relationships. Methods of phylogenetic analysis and current hypotheses regarding angiospermphylogeny are emphasized. Lab will focus on the formand floral structure of about 30 local plant families. One 3-hour laboratory. Expected preparation: Bi 330 .
Also offered for undergraduate-level credit as Bi 435 and may be taken only once for credit. . Corequisite: Bi 535L.

## Bi 535L-Plant Systematics Lab(0)

Lab for Bi 535.
Corequisite: Bi 535.

## Bi 536 - Behavioral Endocrinology (4)

Comparative examination of the major hormone systems that regulate behavior across the animal kingdom. Emphasizes the reciprocating nature of hormone and behavior interactions and seeks to understand how natural selection drives the evolution of hormone structure and function.

Also offered for undergraduate-level credit as Bi 436 and may be taken only once for credit. Prerequisite:
Completion of Bi 320 with a C- or above.

## Bi 537 - Physiological Adaptations to Extreme Environments (3)

Cellular, biochemical and physiological adaptations that allow animals to thrive in the Earth's harshest habitats with a focus on what makes species fromextreme environments unique.
Also offered for undergraduate-levelcredit as Bi 437 and may be taken only once for credit.

## Bi 538 - Plant Chemical Biology (3)

Covers the diversity and function of chemical plant traits and their impact on plant-associated organisms. Students will learn about groups of compounds, their regulation, effects and potential applications and will gain an understanding of how different plant traits functionally interact including positive (defense syndromes) and negative (tradeoffs) as sociations. Prior completion of Bi 330 recommended.
Also offered for undergraduate-levelcredit as Bi 438 and may be taken only once for credit. Prerequisite: Bi 211 and Bi 212.

## Bi 540 - Evolutionary Medicine (4)

An introduction toevolutionary thinking as it applies to human diseases, traits, diet, and aging. Concepts in evolutionary theory will provide a framework for understanding the ultimate causes of human ailments. Expected preparation: Bi 358 .
Also offered for undergraduate-levelcredit as Bi 440 and may be taken only once for credit. Prerequisite: one year of introductory biology.

## Bi 541 - Plant Physiology (5)

Metabolic activities of plants. Two 3-hour laboratory periods.

Also offered for undergraduate-levelcredit as Bi 441 and may be taken only once for credit. Corequisite: Bi 541 L .

## Bi 541L - Plant Physiology Lab (0)

Lab for Bi 541.
Corequisite: Bi 541.

## Bi 542 - Plant Physiology (3)

Biochemical activities of plants, photosynthesis, and respiration. Course is intended to be taken in sequence with Bi 441 . Expected preparation: Bi 441.
Also offered for undergraduate-levelcredit as Bi 442 and may be taken only once for credit. .

## Bi 543 - Advances in Plant Physiology (3)

Lectures and discussions on selected topics in plant physiology; evaluation of current trends in this field.

Expected preparation: $\operatorname{Bi} 442$ (or concurrently). May be repeated onceforcredit.

Also offered as Bi 643 .

## Bi 547 -Scientific Teaching (4)

Designed for upper-division science majors and graduate students interested in learning about best practices in teaching and learning science. In this interactive course students will gain experience in curriculumdesign and delivery as well as engage with education research literature.

Also offered for undergraduatecredit as $\operatorname{Bi} 447$ and may be taken only once for credit. Prerequisite: Graduate-level standing.

## Bi 550 - Phylogenetic Biology (4)

The history of life's diversification through the useof phylogenetic trees, with a focus on how genes, organis ms, and traits have evolved. Includes hands-on computer analyses of DNA sequences.
Also offered for undergraduate-level credit as Bi 450 and may be taken only once for credit.

## Bi 552 - Cancer Biology (4)

Provides the fundamentals of cancer biology. Topics include: altered membrane receptor and cytoplasmic signaling; altered cell: cell interactions; dysregulated cell cycle, apoptosis, and senescence; angiogenesis; and altered cellular adhesion.

Also offered for undergraduate-level credit as Bi 452 and may be taken only once for credit. Prerequisite: $\mathrm{Bi} 334, \mathrm{Bi}$ 336, Bi 341, one quarter of Organic Chemrecommended.

## Bi 553 - Biology of Aging (3)

The study of molecular and structural changes in animals as a function of age. Emphasis is on the basic biological factors which limit life-span. Recommended prerequisites: Bi 336 or biochemistry, $\operatorname{Bi} 487$.

## Bi 555 -Histology (6)

Systemic study, description, and identification of histological structures. Two 3-hour laboratory periods.
Also offered for undergraduate-level credit as Bi 455 and may be taken only once for credit.

## Bi 555L - Histology Lab (0)

Lab for Bi 555.

## Bi 556 -Developmental Biology (4)

Explores basic principles of how organisms develop froma fertilized egg into a complex, multicellular adult. Focuses
on contemporary issues in developmental biology, including pattern formation, morphogenesis, determination, and differentiation in vertebrates and invertebrates.
Also offered for undergraduate-levelcredit as Bi 456 and may be taken only once for credit. . Prerequisite: Bi 336 and Bi 341.

## Bi 562 - Cellular Neuroscience (4)

Presents a study of the sophis ticated electrical and chemical signals used by cells of the brain to coordinate and dis seminate information about the body and its environment. This working knowledge of thecellular and molecular biology of neurons will serve as the foundation for the understanding of activity dependent circuit formation and brain development.

Also offered for undergraduate-levelcredit as Bi 462 and may be taken only once for credit.

## Bi 563 - Systems Neuroscience (4)

Explores movement and the mechanisms by which organis ms transduce, encode, and ultimately perceive information from both theexternal and internal environment. Topics: Touch and Proprioception, Pain, Vis ion, Auditory System, Vestibular System, Chemical Senses, Lower Motor Neuron Circuits and Motor Control, Upper Motor Neuron Control of the Brainstemand Spinal Cord, Modulation of Movement by the Basal Ganglia, Modulation of Movement by the Cerebellum, Visceral Motor System. Expected preparation: Bi 462.
Also offered for undergraduate-levelcredit as Bi 463 and may be taken only once for credit.

## Bi 571 - Plant Ecology (4)

A study of the interrelationships between plants and their environment with emphasis upon individual adaptation and community dynamics. One 3-hour laboratory period.
Also offered for undergraduate-levelcredit as Bi 471 and may be taken only once for credit. . Corequisite: Bi 571 L .

## Bi 571L - Plant Ecology Lab (0)

Lab for Bi 571.
Corequisite: Bi 571.

## Bi 572 - Natural History (3)

A study of plant and animal interrelationships, emphasizing maintenance of proper field records, identification, distribution, and ecology of vertebrates in Oregon. Includes one two-hour laboratory.
Also offered for undergraduate-levelcredit as Bi 472 and may be taken only once for credit. Corequisite: Bi 572L.

Bi 572L-Lab for Bi 572 (0)
Lab for Bi 572.
Corequisite: Bi 572.

## Bi 573 - Field Sampling (4)

The methods commonly employed for collecting and interpreting ecological data. One 3-hour laboratory.

Also offered for undergraduate-level credit as Bi 473 and may be taken only once for credit.

## Bi 576 - Population Ecology (5)

Course is designed to explore methods to describe population growth and dy namics of plants and animals. The theoretical foundation for the evolution of life histories will be explored, along with analysis of the influence of inters pecific interactions on population processes. Larger landscape-level questions will be addressed by examining populations fromthe framework of source-sink dynamics, ecological traps, and metapopulations.

Also offered for undergraduate-level credit as Bi 476 and may be taken only once for credit. .
Bi 576L - Population Ecology Lab (0)
Lab for Bi 576.

## Bi 578 - Terrestrial Community Ecology (3)

Study of how plant, animal, and microbial communities are as sembled across time and space. Emphasis will include understanding interactions among species and the causes of biological diversity in terrestrial systems.
Also offered for undergraduate-level credit as Bi 478 and may be taken only once for credit. Prerequisite: Graduate standing or Bi 357.

## Bi 579 - Plant Reproductive Biology (5)

Covers the diversity processes and functions of sexual and asexual reproduction of plants. Students will learn about pollination, anatomy, morphology, and physiology of plant reproduction. They will develop an understanding of how biological processes contribute to the ecology and evolution of veget ative growth and flowering. Three hours of lecture and 5 hours of lab per week; there are 2 mandatory field trips.
Also offered for undergraduate-level credit as Bi 479 and may be taken only once for credit. Prerequisite: Successful completion of Bi 330 with a C - or better.

## Bi 581 - Microbial Physiology (3)

Physiology and biochemistry of microorganisms. Modern contributions to microbiology emphasized. Micro- and macro-molecular anatomy of microbial cells; energy
metabolism, biosynthetic pathways and their regulation, kinetic and molecular aspects of growth, genetics, evolution, and ecology.
Also offered for undergraduate-levelcredit as Bi 481 and may be taken only once for credit.

## Bi 585 - Advances in Microbiology (3)

Analysis of new developments in microbiology including metabolic pathways, an aerobic systems, mechanis ms of pathogenicity, and the exploitation of microorg anisms to generate products for mankind. Expected preparation: Bi 380.

Also offered as Bi 685 and may be taken only once for credit. .

## Bi 586 - Pathogenic Bacteriology (4)

Study of bacteria pathogenic to humans and their relationship to infectious dis ease. Emphasis on the biochemical mechanismof infection and laboratory diagnosis.

Also offered for undergraduate-levelcredit as Bi 486 and may be taken only once for credit. . Prerequisite: BI 480 .

## Bi 587 - Immunology and Serology (4)

Topics include the tis sues and cells of the immune system, discrimination between self versus foreign antigen, the structure, function and genetics of antigen receptors, components and coordination between innate and adaptive responses, and disease res ponse and susceptibility.

Also offered for undergraduate-levelcredit as Bi 487 and may be taken only once for credit.

## Bi 589 - Microbiology Physiology Laboratory (1)

Application of the principles of microbiology in the laboratory. One 3-hour laboratory period. Expected preparation: concurrent with $\mathrm{Bi} 481 / 581$.
Also offered for undergraduate-levelcredit as Bi 489 and may be taken only once for credit. .

## Bi 590 - Advanced Comparative Physiology (4)

Advanced topics and currentresearch on various aspects of comparative physiology. Expected preparation: Bi 417 or Bi 418 and Bi 419.

Also offered as Bi 690 and may be taken only once for credit. .

## Bi 592 - Advanced Topics in Marine Mammals (2)

A study of one or more advanced topics in marine mammals; covering new developments in regard to their evolution, physiological and anatomical adaptations, echolocation, population structure and dynamics, and behavior. Expected preparation: Bi 416.

Also offered as Bi 692 and may be taken only once for credit. .

## Bi 595 - Advanced Topics in Genetics (2)

New developments in genetics. Topics to includecurrent research in the areas of genetics, human genetics, evolutionary genetics, and moleculargenetics. Expected preparation: Bi 341 .
Also offered as Bi 695 and may be taken only once for credit. .

## Bi 596 - Advanced Topics in Evolution (2)

New developments in evolution. A study of one or more advanced topics relating to the patterns and processes of microevolution and macroevolution. Expected preparation: Bi 426.

Also offered as Bi 696 and may be taken only once for credit. .

## Bi 597 - Advanced Topics in Mammalogy (3)

Study of one or more advanced topics in mammalogy.
Also offered as Bi 697 and may be taken only once for credit.

## Bi 598 - Graduate Research Prospectus (3)

Each student develops and presents a thesis prospectus. The prospectus is to include a review of the literature and a detailed statement of significance, specific aims, research design, and methods. All entering biology graduate students (M.S.T.,M.A./M.S. and Ph.D.) are required to take this course.

Also offered as Bi 698 and may be taken only once for credit.

## Bi 599 - Graduate Grant Writing (3)

Each student is required to write a major grant proposal based on their research prospectus. All biology graduate students (M.S.T., M.A./M.S. and Ph.D.) are required to take this course. Expected preparation: Bi 598.

Also offered as Bi 699 and may be taken only once for credit. .

## Bi 601 - Research (0-9)

See department for course description. (Credit to be arranged.)

## Bi 603 -Dissertation (0-12)

See department for course description. (Credit to be arranged.)

## Bi 604 - Cooperative Education/Internship (1-9)

See department for course description. (Credit to be arranged.)

## Bi 605 - Reading and Conference (0-9)

See department for course description. (Credit to be arranged.)

## Bi 606 - Projects (1-9)

(Credit to be arranged.)

## Bi 607 -Seminar (1-9)

See department for course description. (Credit to be arranged.)

## Bi 610 -SelectedTopics (1-9)

See department for course description. (Credit to be arranged.)

## Bi 643 - Advances in Plant Physiology (3)

Lectures and discussions on selected topics in plant physiology; evaluation of current trends in this field. Expected preparation: Bi 442 (or concurrently). May be repeated once for credit.
Also offered as Bi 543. .

## Bi 685 - Advances in Microbiology (3)

Analysis of new developments in microbiology including metabolic pathways, anaerobic systems, mechanis ms of pathogenicity, and the exploitation of microorganisms to generate products for mankind. Expected preparation: Bi 380.

Also offered as Bi 585 and may be taken only once for credit. .

## Bi 690 - Advanced Comparative Physiology (4)

Advanced topics and currentresearch on various aspects of comparative physiology. Expected preparation: Bi 417 or Bi 418 and Bi 419.

Also offered as Bi 590 and may be taken only once for credit. .

Bi 692 - Advanced Topics in Marine Mammals (2)
A study of one or more advanced topics in marine mammals; covering new developments in regard to their evolution, physiological and anatomical adaptations,
echolocation, population structure and dynamics, and behavior. Expected preparation: Bi 416 .

Also offered as Bi 592 and may be taken only once for credit. .

## Bi 695 - Advanced Topics in Genetics (2)

New developments in genetics. Topics to includecurrent research in the areas of genetics, human genetics, evolutionary genetics, and molecular genetics. Expected preparation: Bi 341 .
Also offered as Bi 595 and may be taken only once for credit. .

## Bi 696 - Advanced Topics in Evolution (2)

New developments in evolution. A study of one or more advanced topics relating to the patterns and processes of microevolution and macroevolution. Expected preparation: Bi 426.
Also offered as Bi 596 and may be taken only once for credit. .

## Bi 697 - Advanced Topics in Mammalogy (3)

Study of one or more advanced topics in mammalogy.
Also offered as Bi 597 and may be taken only once for credit.

## Bi 698 - Graduate Research Prospectus (3)

Each student develops and presents a thesis prospectus. The prospectus is to include a review of the literature and a detailed statement of significance, specific aims, research design, and methods. Allentering biology graduate students (M.S.T., M.A./M.S. and Ph.D.) are required to take this course.
Also offered as Bi 598 and may be taken only once for credit.

## Bi 699 - Graduate Grant Writing (3)

Each student is required to write a major grant proposal based on their research prospectus. All biology graduate students (M.S.T., M.A./M.S. and Ph.D.) are required to take this course. Expected preparation: Bi 598.
Also offered as Bi 599 and may be taken only once for credit. .

## BSt - Black Studies

BSt 199 - Special Studies (1-4)
See department for course description. (Credit to be arranged.)

## BSt 202 - Introduction to Black Studies (4)

Overview of African, African American, Afro-Latin@ and Caribbean studies and the historical and theoretical underpinnings of black studies and inter? and multidisciplinary fields of study.

## BSt 203 - African American History I - Slavery to the Harlem Renaissance (4)

Historical foundations of African Americans in the New World focusing on significant events and eras including slavery, the Civil War, Reconstruction, and the Harlem Renais sance. This is the first course in a sequence of two: BSt 203 and BSt 204.

## BSt 204 - African American History II - From the Depression Era to Civil Rights (4)

African Americans in the New World focusing on significant events and eras including the Great Depression, Black Migration, and the burgeoning civil rights era. This is the second course in a sequence of two: BSt 203 and BSt 204.

## BSt 206 - Caribbean Studies (4)

Interdisciplinary examination of the historical and cultural experience of the Caribbean and Afro-Latin @. Special attention will be given to issues in the creation of multicultural society, such as the dynamics of res is tance and the interplay of cultural identity and political domination.

## BSt 207 - Race, Class, and Gender (4)

Analysis of the intersections of the socially constructed categories of race, class, and gender in African dias poric societies.

## BSt 211 - Introduction to African Studies (4)

An introductory course designed to provide students with an understanding of methods and sources used by the historian of the African past. Museumvisits, guest speakers, and films will supplement the lecture format. In addition to a survey of major themes and issues in the history of the African continent, the course will consider the rise of complex societies, indigenous African towns, agricultural and technological achievements, African state systems, and the impact of international trade and Islamon Africa.

## BSt 214 - Contemporary Race and Ethnic Relations (4)

Addresses the origins and manifestations of the sociohistorical concept of race. Critical theory approach is used to analyze the manner in which race has been interpreted and its influence on the socio-political relations between races and ethnic groupings. Emphasis on topical race issues.

## BSt 221 - Introduction to African American Literature (4)

An overview of African American fiction, poetry, drama, and expository prose.

## BSt 261 - The African American Economic Experience (4)

African Americans and the economic system. Overview of slave and peonage systems, sharecropping, occupational and employment discrimination, economic boycotts, welfare system, and the underground economy.

## BSt 299 -Special Studies (1-4)

(Credit to be arranged.)

## BSt 301 - Women in African History (4)

Surveys the rich and deeply layered history of African women, especially froman African perspective. We will examine the historical forces that shaped, and continue to shape, African women's lives, as well as the ways in which African women have been agents in the making of their own histories. This course illuminates the critical role which African women, of vary ing nationalities, clas ses, ethnicities, religions, and regions, have played in African and globalhistory.
Cross-Listed as: This is the same course as Hst 301 and may be taken only once for credit.

## BSt 302U- The Contemporary African American Experience (4)

Survey course on the African American experiencein the 20th and 21st centuries, including social conditions, family, economics, legal cases, race relations, arts.

## BSt 304 - The Civil Rights Movement (4)

Covers the his tory of the Civil Rights Movement fromits early days during WWII through theend of the 1960s. Explores the social, political, economic, and legal challenges, movement leaders, organizations, movement
resources, key movement events, and the role of the media and U.S. government.

Prerequisite: BSt 202 or BSt 203.

## BSt305U - African History, Before 1800 (4)

Surveys the history of the African continent from the period of European exploration to the eve of colonialism. Examines impact of the European presenceon African institutions and trade, and the relative importance of the environment, technology, and indigenous social systems on the transformation of African society prior to 1800. This is the same course as Hst 312U and may be taken only once for credit.
Prerequisite: BSt 202 or BSt 211. Cross-Listed as:Hst 312U.

## BSt306U - African History, 1800-Present (4)

Survey the his tory of the African continent from 1800 to the present with an emphasis on the colonial period, independence, and post-independence. This is the same course as Hst 313U and may be taken only once forcredit.

Prerequisite: BSt 211. Cross-Listed as:Hst 313U.

## BSt 316 - Issues in African American Education (4)

The U.S. education systems and African-Americans. An his torical overview and contemporary analy sis of legal is sues related to education, including public and private education, community control of schools, citizen involvement, alternative education forms, school desegregation and re-segregation.

## BSt 318U- Black Families in the U.S. (4)

Overview of contemporary theories and research of the Black family in the U.S. Examination of the historical and socio-economic contexts surrounding families and the impacts on family structure andexperiences. Topics for discussion include health issues, family formations, racism, community organizing, welfare and economic security.

Cross-Listed as: This is the same course as CFS 318U and may be taken only once for credit.

## BSt319U-Traditional Cultures of Africa (4)

Examines features of African cultures, including environment and people, oral traditions, time and seasons, naming and numbering systems, language and communication systems, religious, political and legal institutions, music, dance, and family. This is the same course as Anth 319U and may be taken only once for credit. Expected preparation: BSt 211 or Sophomore Inquiry.
Cross-Listed as: Anth319U.

## BSt 325U- Race and Ethnicity in Latin America (4)

African descent in Latin America using theoretical and empirical research on race and ethnicity in the region. Regional and national variations concerning racial and ethnic identity and the intersection of race/ethnicity, gender and socialclass and an exploration of how Blackness is contested in the media.

## BSt 326U- Cuba, Dominican Republic, Puerto Rico (4)

History, culture, politics, geography, gender relations, race, ethnicity, and spirituality of the people of the Spanish speaking Caribbean?Cuba, the Dominican Republic, and Puerto Rico. Focus on Indigenous people of the Caribbean, impact of European colonization on the region, political resistance, nation building and creative identity-making.

## BSt 333 - Protests andPeople Power in Contemporary Africa (4)

Analyzes Africa's protest and social movements in the contemporary period using bothhistorical events and scholarly analysis. It provides a multi-faceted account of Africa's protestand activismpolitics as rooted in its historical and geographical specificities while centering the discourseon "people power." We will examine much broader questions of social and historical significance like the relation between human agency and his torical change, contestations of power, voice[s] of the people, gender, rights, continuity and discontinuity, and new forms of protest like digital protests.

## BSt 335U- The Multi-Racial Experience (4)

Explores what it means to identify oneself or be identified as multiracial/ethnic. Considers how social class, gender, race and other factors shape the multiracial experience. In addition, explores interracial relationship and the representation of multiracials in the media.

## BSt 339U- Afro-Futurisms/Black Science Fiction (4)

This class begins with thehis torical roots of AfroFuturisms/Black Science Fiction. Using selected reading the class will compare and contrast the science fiction and fantasy written by Africans \& African Diaspora authors. Will also explore in movies and television the contributions of Black people in science fiction.

## BSt 342U- Black Feminism/Womanism (4)

His torical evolution of black feminist theory fromslave narratives to contemporary manifestations of black feminism including hip hop feminis $m$. Feminist resistance
in the context of race and gender. Analysis of the pluralism within black feminis $m$ including black les bian feminis $m$, womanist theology, and radical black subjectivity.

## BSt 345U- Black Popular Music: Contextualizing the Black Experience (4)

Explore and contextualize the cultural politics of Black popular music and its implications as a vehicle for interrogating race, class, gender, and sexuality in contemporary U.S. culture. Historical unfolding and developing trends used to demonstraterelevant and as sociated black experience(s).

## BSt 351 U - African American Literature I (4)

An introduction to literature written by and about African Americans from the colonial period to the era of the abolition of slavery.
Cross-Listed as: This is the same course as Eng 351U and may be taken only once for credit.
BSt 352U - African American Literature II (4)
An introduction to African American literature fromthe mid-nineteenth century to the beginnings of the "Black Arts" movement.

Cross-Listed as:This is the same course as Eng 352U and may be taken only once for credit.

## BSt 353U - African Women in Film (4)

This course examines portrayals of African women in cinema using selected films from African and African American, traditional Hollywood films and films by African filmmakers. Approaches in comparative analyses of African films are used to examine depictions of African women in traditional and contemporary cultural settings through discussions and reviews.

## BSt356U- Cuban Film: Politics and Culture (4)

Topics in Cuban history, culture, race, gender, and politics, focusing on the impact of the Cuban revolution on Cuban society, presented through Cuban films are addressed. Films, particularly popular films made in Cuba, and media as primary methods of inquiry, and their global political and cultural implications are critically examined.

## BSt357U- Caribbean Spirituality and Resistance (4)

His torical and contemporary diversity of Afro-Creole spiritual/religious practices in the Caribbean. Rituals and beliefs of Indigenous Taino and African origin, Afro Cuban religious systems, Dominican worldview and spirit
practice, Rastafari, Obeah, Vodou, and Spiritism. Conceptions of spirituality in synchretic, creolized spirit systems in colonized, transnational, globalized AfroCaribbean society.

## BSt 359U- The African Diaspora in Europe (4)

The primary focus of this course is to understand and explore what it means to be a pers on and/or community of African descent living in Europe. The methodology will be based on a social, cultural and historical analysis.

## BSt 362U- African Prehistory (4)

Methods, sources of evidence, and the results of the study of prehistoric cultures of Africa fromthe earliest traces until the first written records; it includes human origins (physical and cultural evolution), theearliest civilization, peopling of Africa, migrations, earliest settlements, origins of agriculture and metallurgy. This is the same course as Anth 362U and may be taken only once for credit.

Prerequisite: BSt 211, Anth 102. Cross-Listed as: Anth 362U.

## BSt 363U- African Cinema and African Cultures (4)

African cultures are explored through reviews of African cinema using an annual Portland film festival occurring during the term, and/or in-clas s screenings. Nature and relevance of African cinema are examined from global perspectives and approaches to film analysis and interpretations; the impact and contributions to understanding African cultures are discussed.

## BSt 368 - Gender and Sexualities in Africa (4)

Examines gender and sexualites in Africa froman African pers pective. We will explore, among other things, the complex, and oftentimes contradictory, meanings attached to gender and sexuality in various African contexts, the notions of gendered and sexualized identifications, the different historical and social constructions of gender and sexualities in African societies. The course asks how subSaharan African contexts challenge Western or Global North conventional conceptualizations of gender and sexualities. Expected Preparation: A general knowledge of African history is recommended.

## BSt 372U - Post-colonial Studies of Africa (4)

Study of the social, political, and economic dimensions of imperialism in twentieth century Africa fromthe perspective of post-colonialstudies. This is the same course as Intl372U and may be taken only once for credit.

Cross-Listed as:This is the same course as Intl1372U and may be taken only once for credit.

## BSt377U - Vodoun, Rasta and Islam in the African Diaspora (4)

Historical and cultural background on how Voudun, Is lam, and Ras tafarianismbecame major ingredients in political, religious, and social movements in the African Diaspora. Cultural, political and economic implications and impacts are discussed.

## BSt 378 - Philosophy of Race (4)

Explores philosophical as sumptions involved in the concept of race, as well as the political realities of racial identities. This course is concerned with the metaphysical legitimacy of race, as well as the social, ethical, and political effects of race. Students will explore the relationship of the social categ ories of race to the persistence of racism.

## BSt384U - African Immigrant Communities in Oregon (4)

Historical and recent African immigration to the United States are interrogated for form/nature and function in light of assimilation (i.e., melting pot) expectations. Survey of classical and contemporary migration literature and discovery of the Oregon African immigrant milieu in a global context and perspective are used in search for answers. Expected preparation: BSt 202, 211A or any lower division BSt course.

## BSt 396 - Research Methodologies in Black Studies (4)

Introduces students to the process of conducting research using qualitative research methods in the humanities and social sciences. Exploration of research methods including, but not limited to, interviewing, content analysis, archival research, library research, Internet research, and participant-observation.
Prerequisite: BSt 202, BSt 203, BSt 204 or BSt 206 and upper-divisionstanding.

## BSt 399 -Special Studies (1-5)

See department for course description. (Credit to be arranged.)

## BSt 399U-Special Studies (1-4)

(Credit to be arranged.)

## BSt 401 - Research (0-6)

See department for course description. (Credit to be arranged.)

## BSt 402 - Independent Study (1-12)

See department for course description. (Credit to be arranged.)

## BSt404-Cooperative Education/internship(1-12)

See department for course description. (Credit to be arranged.)

## BSt 405 - Reading and Conference (0-6)

See department for course description. (Credit to be arranged.)

## BSt 406 - Special Projects (1-12)

(Credit to be arranged).

## BSt 407 -Seminar (1-6)

See department for course description. (Credit to be arranged.)

## BSt 408 - Workshop(1-6)

See department for course description. (Credit to be arranged.)

## BSt 409 - Practicum(1-12)

See department for course description. (Credit to be arranged.)

## BSt 410 -Selected Topics (1-6)

See department forcourse description. (Credit to be arranged.)

## BSt 411 - African American History Seminar (4)

In-depth analysis of critical topics and is sues in African American history. The content of the course is topical rather than chronological and the approach will emphasize specific periods, individuals, or relevant developments for a concentrated treatment in a seminarenvironment. This course may be repeated twice for credit.

Also offered for graduate-level credit as BSt 511. Prerequisite: BSt 202 or BSt 203 or BSt 204; or advisor approval of a comparable course; and junior or senior status.

## BSt 412 - Oregon African American History (4)

Examination of the black experience in Oreg on history. Topics include the slavery controversy in early Oregon development, contributions of blacks to the growth of the state, black migration during World War II, the Vanport flood, and various legislative actions related to black status in Oregon.

Prerequisite: Junior or senior status or permis sion from the instructor.

## BSt 413 -Slavery (4)

An examination of the role of slavery in establishing and reinforcing the status and position of the black population in the U.S. and the Caribbean, including physical and psychological impacts, racial classifications, and colorism. Comparative analysis of the numerous forms of slave systems and the impact of slave rebellions.
Prerequisite: BSt 202, BSt 203, BSt 206 and BSt 214.

## BSt414-Racism (4)

Survey of the social-psychological, pseudo-scientific, and biologicalliterature and their impact on individual and cultural forms of racism in America. Utilization of rationalizations and the processes and machinery of oppression as constructed by white European and American governments to control and exploit the resources of non-white peoples will be examined.

## BSt 415 - Race, Justice, and Punishment (4)

Examination of historical and contemporary incarceration in the U.S. including slavery, Reconstruction, and Jim Crow eras through the lens of race, class, gender, sexual identity, nationality, power and privilege. Responses to demands for justice and exploration of the use of racial ideologies in the development of a racialized prison/carceral system.
Prerequisite: BST 202 or permis sion of the chair. Corequisite: NA.

## BSt 419 - African American Women in America (4)

Designed to investigate the evolution of the African American woman from slavery to the contemporary period. African American women's agency will be examined in the antis lavery, suffrage, club, civil rights, nationalist, black feminist, and current movements for socialjustice.

Prerequisite: BSt 207.

## BSt 420 - Caribbean Literature (4)

A selection of poetry and fiction from the English and French speaking Caribbean (in translation where necessary).
Prerequisite: One previous African American literature course and 12 additional literature credits.

## BSt 421 - African American Writers (4)

Examination of significant African American literary figures. A particular author or literary period of writing is identified, read, analyzed, and discussed. Major works and history of the period are included with special consideration given to the relationships between the topic of focus and the larger spheres of writing.
Also offered for graduate-level credit as BSt 521 and may be taken only once for credit. . Prerequisite: BSt 221.

## BSt 422 - African Fiction (4)

Readings in African fiction in regional, cultural, generational, and gender contexts. This is the first course in a sequence of two: BSt 422 and BSt 423.

Prerequisite: One previous African American literature course and 12 additional literature credits.

## BSt 425 - Black Cinema: the 1970s (4)

Examination of the treatment of Black themes, issues and characterization during the decade of the 1970s in the cinema industry. Particular attention on the genre of the Blaxploitation film as an industry response to the rapidly shifting social and racial dy namics of American culture as the Civil Rights era concluded.
Prerequisite: Upper-division standing.

## BSt 426 - Contemporary African American Cinema (4)

Examination of the treatment of Black themes, issues, and characterization in the contemporary cinema industry. Particularattention will be focused on the development of new Black actors, directors, and producers. The impact of these new factors in the industry will be analyzed for the influence they have on the traditions of cinema history relative to the Black experience.
Prerequisite: Upper-division standing.

## BSt 430 - Black Political Thought (4)

Theories of Black nationalism, including the political thought of Martin Delany, Aime Cesaire, FrantzFanon, Albert Memmi, Booker T. W ashington, W.E.B. DuBois, MalcolmX, Marcus Garvey, and others.
Also offered for graduate-level credit as BSt 530 and may be taken only once for credit. . Prerequisite: Upperdivision standing.

## BSt440 - Caribbean Studies (4)

Interdisciplinary examination of his torical or cultural is sues in the Caribbean experience. Emphasis will be on is sues and dilemmas related to the creation of a multicultural society.
Prerequisite: BSt 206 or BSt 211.

## BSt 444 -Food Justice (4)

Food justice is studied froma holistic perspective, which considers the complexities and intersections of ecological, cultural, nutritional, political and socioeconomic factors in the production and consumption of food. As a Black Studies food justice class, we study the historic background and diversity of Afro descent food ways, and look at contemporary topics of environmental justice, land and food access, cultural identity and appropriation. We also employ pedagogies that engage our understanding of growing food, cooking food, and eating food.
Prerequisite: Upper division standing.

## BSt 450 - Topics in African/Caribbean History And Culture (4)

In-depth exploration of selected topics in African and/or Caribbean culturalhistory. Special attention will be given to thematic is sues of broad application to the understanding of culturalinteraction, continuity, and change.
Also offered for graduate-level credit as BSt 550.
Prerequisite: BSt 203, BSt 204, BSt 206, or BSt 211.

## BSt 466 - History of the Black Panther Party (4)

Examination of historical conditions and context that gave birth to the Black Panther Party. Analysis of the political platform, work and ideology of the Party and governmental and societal res ponses. Is sues of race, class, gender and sexuality, the intersections of identity, and the Party's legacy nationally and globally.
Also offered for graduate-level credit as BSt 566 and may be taken only once for credit. Prerequisite: Prerequisites: Two courses in BSt or permission fromthe department chair.

## BSt 467 - African Development Issues (4)

An examination of the causes of poverty and underdevelopment of the African continent. A comparative analys is of pre-colonial, colonial and post-colonial circumstances will be conducted.

Prerequisite: BSt 211.

## BSt 484 - African American Community Development

 (4)Study of community development and applicability to African American communities. Topics include
community development, community organization, ghettos as colonies, citizen participation, change agents, planning, and socialchange implications. Expected preparation: BSt 202, BST 203, or BSt 204 or course in Blackhistory and culture.

Prerequisite: Junior or senior status.

## BSt 489 - Afro-Latin@ Narratives (4)

This course explores through poetry, songs, music, stories, (auto)-biographical accounts and novels the creativity and meaning produced by people of African descent living in or from Latin America. Throughexamining the narrative expressions of Afro-Latin Americans we can consider the relationship that social his torical processes have on narrative production.

Also offered for graduate-level credit as BSt 589 and may be taken only once for credit. Prerequisite: Upper-division standing.

## BSt 502 - Independent Study (1-9)

(Credit to be arranged.)

## BSt 505 - Reading and Conference (1-8)

(Credit to be arranged.)

## BSt 506 - Overs eas Experience (1-8)

Community-based learning in an international context throughimmersion in departmental programs in Africa and/or the Caribbean. Travel programs provide students with rich, multicultural environments in which to learn and serve international communities.
Prerequisite: Application for admis sion to the overseas programs is required.

## BSt 507 -Seminar (1-6)

See department for course description. (Credit to be arranged.)

## BSt 509 - Practicum(1-9)

(Credit to be arranged.)

## BSt 510 -SelectedStudies (1-6)

(Credit to be arranged.)

## BSt 511 - African American History Seminar (4)

In-depth analysis of critical topics and issues in African American history. The content of the course is topical
rather than chronological and the approach will emphasize specific periods, individuals, or relevant developments for a concentrated treatment in a seminar environment. This course may be repeated twice forcredit.
Also offered for undergraduate-levelcredit as BSt 411. Prerequisite: BSt 202 or BSt 204 and junior or senior status.

## BSt 512 - Oregon African American History (4)

Examination of the blackexperience in Oreg on history. Topics include the slavery controversy in early Oregon development, contributions of blacks to the growth of the state, black migration during World War II, the Vanport flood, and various legislative actions related to black status in Oregon.

Prerequisite: BSt 202 or BSt 204 and junior or senior status.

## BSt 513 -Slavery (4)

An examination of the role of slavery in establishing and reinforcing the status and position of the black population in the U.S. and the Caribbean, including physical and psychological impacts, racial classifications, and colorism. Comparative analysis of the numerous forms of slave systems and the impact of slave rebellions.

Prerequisite: BSt 202, BSt 203, BSt 206 and BSt 214.

## BSt 514 - Racism (4)

A survey of the pertinent social-psychological literature on individual and cultural forms of racismin America. The rationalizations, processes and machinery of oppression as cons tructed by white European and American governments which control and exploit the res ources of non-white peoples will be examined. Special attention will be paid to the theoretical social-psychological explanations of black/white differences.
Prerequisite: BSt 207, BSt 211, or BSt 214, UnSt 212.

## BSt 520 - Caribbean Literature (4)

A selection of poetry and fiction fromthe English and French speaking Caribbean (in translation where neces sary).
Prerequisite: One previous African American literature course and 12 additional literature credits.

## BSt 521 - African American Writers (4)

Examination of significant African American literary figures. A particular auth or or literary period of writing is identified, read, analyzed, and discussed. Major works and history of the period are included with special cons ideration given to the relationships between the topic of focus and the larger spheres of writing.
Also offered for undergraduate-level credit as BSt 421 and may be taken only once for credit. . Prerequisite: BSt 221.

## BSt 522 - African Fiction (4)

Readings in African fiction in regional, cultural, generational, and gender contexts. This is the first course in a sequence of two: BSt 522 and BSt 523 .
Prerequisite: One previous African American literature course and 12 additional literature credits.

## BSt 525 - Black Cinema: the 1970s (4)

Examination of the treatment of Black themes, issues and characterization during the decade of the 1970s in the cinema industry. Particular attention on the genre of the Blaxploitation film as an industry response to the rapidly shifting social and racial dynamics of American culture as the Civil Rights era concluded.
Prerequisite: upper-division standing.

## BSt 526 - Contemporary African American Cinema (4)

Examination of the treatment of Black themes, issues, and characterization in the contemporary cinema industry. Particularattention will be focused on the development of new Black actors, directors, and producers. The impact of these new factors in the industry will be analyzed for the influence they have on the traditions of cinema his tory relative to the Black experience.

Prerequisite: upper-division standing.

## BSt 530 - Black Political Thought (4)

Theories of Black nationalis $m$, including the political thought of Martin Delany, Aime Ces aire, FrantzFanon, Albert Memmi, Booker T. W ashington, W.E.B. DuBois, MalcolmX, Marcus Garvey, and others.
Also offered for undergraduate-level credit as BSt 430 and may be taken only once for credit. . Prerequisite: Upperdivision standing.

## BSt 540 - Caribbean Studies (4)

Interdisciplinary examination of his torical or cultural is sues in the Caribbean experience. Emphasis will be on is sues and dilemmas related to the creation of a multicultural society.
Prerequisite: BSt 211 or 206.

## BSt 550 - Topics in African/Caribbean History and Culture (4)

In-depth exploration of selected topics in African and/or Caribbean cultural history. Special attention will be given to thematic issues of broad application to the understanding of cultural interaction, continuity, and change.

Also offered for undergraduate-level credit as BSt 450.

## BSt 566 - History of the Black Panther Party (4)

Examination of historical conditions and context that gave birth to the BlackPanther Party. Analysis of the political platform, work and ideology of the Party and governmental and societal res ponses. Is sues of race, class, gender and sexuality, the intersections of identity, and the Party's legacy nationally and globally.

Also offered for undergraduate-level credit as BSt 466 and may be taken only once for credit. Prerequisite: Prerequisites: Two courses in BSt or permission from the departmentchair.

## BSt 567 - African Development Issues (4)

An examination of the causes of poverty and underdevelopment of the African continent. A comparative analys is of pre-colonial, colonial and post-colonial circumstances will be conducted.

Prerequisite: BSt 211.

## BSt 584 - African American Community Development (4)

Study of community development and applicability to African American communities. Topics include community development, community organization, ghettos as colonies, citizen participation, change agents, planning, and social change implications.

Prerequisite: BSt 202 or BSt 204 and junior or senior status.

## BSt 589 - Afro-Latin@ Narratives (4)

This course explores through poetry, songs, music, stories, (auto)-biographical accounts and novels the creativity and meaning produced by people of African descentliving in or from Latin America. Throughexamining the narrative expres sions of Afro-Latin Americans we can consider the relationship that social his torical processes have on narrative production.
Also offered for undergraduate-level credit as BSt 489 and may be taken only once for credit. Prerequisite: Upperdivision standing.

## BSTA - Biostatistics

Courses offered as part of the joint OHSU-PSU School of Public Health.

## BSTA 504 - Cooperative Education/Internship (1-15)

(Credit to be arranged.)

## BSTA 511 - Estimation and Hypothesis Testing for Applied Biostatistics (4)

This course covers a broad range of basic statistical methods used in the health sciences. The course begins by covering methods of summarizing data through graphical displays and numerical meas ures. Bas ic probability concepts will be explored to establish the basis for statistical inference. Confidence intervals and hypothesis testing will be studied with emphasis on applying these methods to relevant situations. Both normal theory and nonparametric approaches will be studied including oneand two-sample tests of population means and tests of independence for two-way tables. Students will be introduced to one-way analy sis of variance (ANOVA), correlation, and simple linear regres sion. The course focuses on understanding when to use basic statistical methods, how to compute test statistics and how to interpret and communicate the results. Computer applications are included as part of the course to introduce students to basic data management, reading output from computer pack-ages, interpreting and summarizing results.

## Also offered as BSTA 611.

## BSTA 512 - Linear Models (4)

BSTA 512 is primarily designed for Biostatistics Graduate Certificate students in Department of Public Health and Preventive Medicine, andBSTA 612 for PhD s tudents from Behavioral Neuroscience or other PhD programs. In this course, we will focus on Linear models that include Regressions Analysis and Analysis of Varience (ANOVA). In conjunction with the conceptual and theoretical supporting the topics. For students of BSTA 612, extra homework problems and reading materials will be as signed along with one extra week of lecture on mixed-effects models for longitudinal/repeared meas ure data.
Also offered as Bsta 612 for doctoral students.

## BSTA 513 - Categorical Data Analysis (4)

Categ orical Data Analysis is the third course in the required sequence for applied Biostatistics (Bsta 511, Bsta 512 , Bsta 513 or Bsta 611 , Bsta 612, Bsta 613). This course covers topics in categorical data analysis such as cross tabulation statistics, statistics for matched samples, and methods to assess confounding and interaction via stratified tables. Students will learn logistic regression, and relate results back to those found with stratified analyses. Similar to linear regression in Bsta 512/Bsta 612, topics for logistic regression will include parameter interpretation, statistical adjustment, variable selection techniques and model fit as sessment. Students will have the opportunity to be exposed to other analysis methods, such as Pois son regression and multinomial logistic regression, etc. We will also learn some machine learning techniques other than logistic regression model. Most homework as signments for this course require the use of statistical software.

## Also offered as BSTA 613 for doctoral students.

## BSTA 514 -Statistical Analys is of Time-to-Event Data

 (3)This course introduces students to analysis of time-to-event (i.e. survival) data, covering methods for estimation, hypothesis testing, and regression methods for censored data with covariates. Methods widely used in the health sciences are covered, including Kaplan-Meier (empirical) estimate of the survival function and its associated statistical tests. The Cox proportionalhazards regression model is presented in detail, along with some extensions of this model. As time allows, other topics will be introduced including parametric survivalmodels, frailty models and/or models incorporating competing risks. Power and s ample size computations for time-to-event data will als o be introduced. Most assignments will be completed using statis tical computing s oftware. Contextualizing results in the context of health sciences problems and research questions is stressed throughout the course.
Prerequisite: A standard pre-calculus course in probability \& statistics (e.g.BSTA 511), a course in applied linear regression models (e.g.BSTA 512).

## BSTA 515 - Data Management \& Analysis in SAS (3)

This course is designed forstudents who want to develop and expand their skills in data management, statistical analyses and graphics for the real world applications using SAS. The course will give students opportunities to build their data management programing skills frombasic to advanced levels in SAS. As part of the course competencies, students will have chance to learn how to export SAS data sets and create ODS files for Micros oft Excel. Students will have chance to build their analy sis skills from bas ic to advanced levels using SAS. The class will be taught in a computer lab in order to give the student hand on experience using SAS to manage data, perform analyses and produce graphs. Class sessions and homework will be oriented around particular data management and analysis tasks. Health-related data sets will be provided fors tudents to practice. This course could be extremely helpful in preparation for thesis, capstone or other research projects.

## BSTA 516 - Design and Analysis of Surveys (3)

This course is designed to introduce basic concepts, techniques, and current practice of sample survey design and analysis. Specific topics covered include introduction to statistical sample design, such as simple random sampling, sy stematic sampling, stratified random sampling, cluster sampling, multistage sampling. Complex designs will also be included. Topics in estimation and analys is include probability weighting, weight adjustments, ratio and regression estimators, and methods for estimating variance fromcomplex surveys. In conjunction with the
conceptual and theoretical developments, homework assignments and data analysis projects will be assigned in supporting the topics.

## BSTA 517 - Statistical Methods in Clinical Trials (3)

This is an online course designed for students and researchers who are interested in learning statistical methods in the design and analysis of clinical trials. Students are expected to have certain statistical background in order to gain deep understanding to the topics covered in this course. Topics to be dis cussed in the course include introduction to clinical trials, fundamentals of Bayesian statistics, s ample size computation for trials with dichotomous, continuous and time-to-event outcomes, methods of randomization, design challenges for oncology clinical trials, Bayesian methods in clinical trials, adaptive clinical trial design and designs for predictive biomarkers.

## BSTA 518 -Spatial Data with GIS (3)

Geographic information system(GIS) software is a powerfultool for as sessment, decision-making, and information sharing. GIS provides a platform for the analys is of health data in relationship to population demographics, socioeconomic factors, surrounding social and health services, and the naturalenvironment. The course will also cover basic statistical methods for the analys is of spatial data such as kriging and spatial clustering. Some statistical graphics may useR. The format of class will be intensive in-class session during the first two weeks of summer quarter and students are required to do homework and course projects with data sets throughout the quarter under the supervision of the instructor.
Prerequisite: BSTA 525 or BSTA 511 and BSTA 512.

## BSTA 519 - Applied Longitudinal Data Analysis (3)

This course is designed for students who have taken the bas ic applied statistical courses and wish to learn the more advanced statistical methods for longitudinal data. Longitudinal data consist of measurements of res ponse variables at two or more points in time for many individuals. This course covers the statistical properties of longitudinal data and special challenges due to the repeated measurements on each individual, exploratory methods and statistical models for longitudinal data as well as some exposure to estimation methods and statistical properties of coefficient estimates. For statistical methods, the course will briefly mention the traditional repeated measure analys is of variance (ANOVA) approach for continuous data, and focus more on mixed effects model approach and estimation based on generalized estimating equation. Real life examples will be used to explain the concept and application of these models by using continuous, binary and count data. Homework as signments and finalclass
project play a central role to understand and appropriately apply the methods covered in the course.
Prerequisite: BSTA 511, BSTA 512, and BSTA 513.

## BSTA 521 -Bayesian Methods for Data Analysis (3)

This course is an electivecourse forstudents in the MS, MPH and Graduate Certificate programin Biostatistics and may also be used as an elective course for students in MPH and PhD in Epidemiology programs and other programs, if they have taken the appropriate prerequisites. The methods students learned in the biostatistics applied and theoretical sequences were based onthe "frequentist" method of statistical reasoning, where probability is understood to be the longrun frequency of a 'repeatable' event, and statistics that are computed are based on a specific study only. Bayesian methods are based on a different philosophy that probability of an event is based on ALLinformation known at the time. Bayesian methods for data analysis enable one to combine information fromprevious similar and independent studies (prior information), with information from a new study, y ielding updated inference for model parameters. This course will cover the concept of Bayes ian analysis, posterior dis tribution, Bayesian inference and prediction, prior determination, one parameter and two parameter models, Bayesian hierarchicalmodels, Bayesian computation, model criticis $m$ and selection as well as bas ic comparis on of Bayesian and Frequentist Inferences. Reallife examples in medical and health science will be used to explain the concept and application of Bayesian models.
Prerequisite: BSTA 511, BSTA 512, and BSTA 550.

## BSTA 522 - Statistical Learning and Data Science (3)

This course is designed to introduce theory and methods for statistical learning and data science. Data science is an emerging field that overlaps with computer science, artificial intelligence, machine learning/deep learning and statistics. This is an exciting time to observe the birth of the new field. In recent years, statistical learning has been increas ingly becoming crucial in data science. Everincreasing data complexity and unconventional data create new challenges for traditional statistical learning, and this is an active research area. This course will covertraditional statistical learning methods as well as newer methods for such challenges.

Prerequisite: BSTA 512.

## BSTA 523 - Design and Analysis of Experimental Designs (3)

This course covers an experimental design and statistical analys is of biological/clinicaldatafromvarious experiments. This course provides not only theoretical aspect of experimental design butalso hand-on experience in designing and analyzing experiments. The course begins design principles that include concepts of replication,
randomization, blocking, multifactorstudies, and confounding. Basic matrix algebra concepts will be explored to establish the basis for linear models. Students, then, are introduced to various experimental designs including analysis of variance (ANOVA) in both single and multi-factorial setting, experiments to study variances, complete/incomplete block des igns (CBD), split plot design, repeated measures ANOVA, analysis of covariance (ANOCOVA), res ponse surface design, and diagnosing agreement between the data and model. The course also provides experiencein analyzing unbalanced experimental. Computer application is included as part of the courseto introduce students to data management, reading output, interpreting and summarizing results.

Prerequisite: BSTA 511.

## BSTA 524 -Statistical Methods for Next Gen Sequencing (3)

This course is designed to introduce the statistical theory and methods for next generation sequencing data(NGS). In recent years, NGS has been the choice of platformfor genomic studies. Due to thehigh dimensionality of NGS, it provides unique challenges in statistical analysis and requires different statistical methods. Although NGS data are the main focus, the theory and methods are applicable to other high dimensional datasuch as microarray and proteomics. This course will cover statistical theory and methods s pecialized for NGS and otherhigh dimensional data. It is strongly recommended that students bring their own laptop computers to classes given.
This is the same course as BSTA 624 and may be taken only once for credit. Prerequisite: BSTA 512 or BSTA 612 and pervious experience in $R$.

## BSTA 525 - Introduction to Biostatistics (4)

The goal of this course is to cover the broad range of statistical methods used in health sciences. Methods of summarizing data through graphical dis plays and numerical measures will be discussed. Basic probability concepts will be explored to establish the basis for statistical inference. Confidence intervals and hypothesis testing will be studied with emphasis in applying these methods to relevant situations. Both normal theory and non-parametric approaches will be studied. Course focus will be to understand when to use basic statistical methods how to compute tests to statistics and how to interpret results. Computer applications (using statistical software) are included as part of the course.
Prerequisite: Graduate standing.

## BSTA 530 - Biostatistics Lab (3)

The course provides hands-on data analysis and/or biostatistical consulting experience to students outside classroomsettings. Students will have opportunities to performdata analysis with inputs fromfaculty members.

Students should have adequate skills in at least one statistical programamong STATA, SAS or R and finished BSTA 512 Linear Models or equivalent. Students meet weekly for $1 \sim 2$ hour with the course instructor for discussion on their projects and are required to have regular meetings with an assigned faculty advisor and/or consultee(s), if applicable. Students are expected to work individually or in a teamof $2 \sim 3$ on actual data analysis. In addition, there is weekly reading assignment. The workload will be at least 9 hours per week including all activities (classes, meetings, readings, coding, and analys is).
Prerequisite: BSTA 512.

## BSTA 550 - Intro to Probability (3)

This course is an introduction to the methods and concepts of probability theory, including combinatorics, conditional probability and independence, dis crete and continuous randomvariables, probability distributions, joint distributions, expectation, transformations of random variables, moment generating functions, and the central limit theorem.
Prerequisite: Acceptance to MS in Biostatistics program.

## BSTA 551 -Statistical Inference I(3)

Statistical Inference I is the first course of a two term course (BSTA $551 \& 552$ ) covering the foundations of statistical inference. It is targeted to graduate students majoring in biostatistics and other disciplines requiring an understanding of statistical theory. The course starts with a review of the probability theory that is the basis for that inference. We will then focus on principles of data reduction and estimation (frequentist and Bayesian methods). We will also introducehypothesis testing, time permitting. The two courses must be taken in sequence.
Prerequisite: BSTA 550 and differential and integral calculus.

## BSTA 552 -S tatistical Inference II(3)

Statistical inference II is the second of a two termcourse (BSTA 551 \& BSTA 552) and provides theoretic foundation in biostatistics. Topics in the second course will include sampling distributions, point and interval estimation, tests of hypotheses, and an introduction to as ymptotic theory. The two courses must be taken in sequence.

## BSTA 611 - Estimation and Hypothesis Testing for Applied Bios tatistics (4)

This course covers a broad range of basic statistical methods used in the health sciences. The course begins by covering methods of summarizing data through graphical dis plays and numerical meas ures. Basic probability concepts will be explored to establish the basis for
statistical inference. Confidence intervals and hypothesis testing will be studied with emphasis on applying these methods to relevant situations. Both normal theory and nonparametric approaches will be studied including oneand two-sample tests of population means and tests of independence for two-way tables. Students will be introduced to one-way analy sis of variance (ANOVA), correlation, and simple linear regression. The course focuses on understanding when to use basic statistical methods, how to compute test statistics and how to interpret and communicate the results. Computer applications are included as part of the course to introduce students to basic data management, reading output from computer pack-ages, interpreting and summarizing results.

Also offered as BSTA 511.

## BSTA 612 - Linear Models (4)

BSTA 512 is primarily designed for Biostatistics Graduate Certificate students in Department of Public Health and Preventive Medicine, and BSTA 612 for PhD students from Behavioral Neuroscience or other PhD programs. In this course, we will focus on Linear models that include Regressions Analy sis and Analysis of Varience (ANOVA). In conjunction with the conceptual and theoretical supporting the topics. For students of BSTA 612, extra homework problems and reading materials will be as signed along with one extra week of lecture on mixed-effects models for longitudinal/repeared meas ure data.

Also offered for graduate-level credit as BSTA 512.

## BSTA 613 - Categorical Data Analysis (3)

Categ orical Data Analy sis is the third course in the required sequence for applied Biostatistics (Bsta 511, Bsta 512 , Bsta 513 or Bsta 611 , Bsta 612 , Bsta 613). This course covers topics in categ orical data analysis such as cross tabulation statistics, statistics for matched samples, and methods to assess confounding and interaction via stratified tables. Students will learn logistic regression, and relate results back to those found with stratified analyses. Similar to linear regression in Bsta 512/Bsta 612, topics for logistic regression will include parameter interpretation, statistical adjustment, variable selection techniques and model fit ass essment. Students will have the opportunity to be exposed to other analysis methods, such as Pois son regression and multinomial logistic regression, etc. We will also learn some machine learning techniques other than logistic regression model. Most homework assignments for this course require the use of statistical software.

Also offered for graduate-level credit as BSTA 513 and may be taken only once for credit.

## BSTA 624 -Statistical Methods for Next Gen Sequencing (3)

This course is designed to introduce the statistical theory and methods for next generation sequencing data(NGS). In recent years, NGS has been the choice of platformfor genomic studies. Due to the high dimensionality of NGS, it provides uniquechallenges in statistical analysis and requires different statistical methods. Although NGS data are the main focus, the theory and methods are applicable to other high dimensional datasuch as microarray and proteomics. This course will cover statistical theory and methods specialized for NGS and other high dimensional data. It is strongly recommended that students bring their own laptop computers to classes given.
This is the same course as BSTA 624 and may be taken only once for credit. Prerequisite: BSTA 512 or BSTA 612 and pervious experience in $R$.

## BSTA 699 -Special Studies (1-8)

(Credit to be arranged.)

## BTA - Business Technology \& Analytics

## BTA 350 - Business Problem Solving with Analytics and Visualization (4)

Focuses on addressing business problems by using quantitative models and computer software to analyze data. Through the useof business scenarios, students develop the skills to structure decision making and assess their findings. Us ing datasets fromindustry, the course provides students with working knowledge and a broad overview of applications that facilitate analysis. Particular emphasis is placed on the application of quantitative analys is tools to real-world datasets, the ability of students to make managerial recommendations based on these analyses, and the use of Excel \& Tableau.

Prerequisite: BA 327 (may be taken concurrently).

## BTA 380 - Data Communications (4)

Topics include communication between people and machines, transmission systems, protocols for communication technologies, and digital communication and networks. Application areas reviewed include data communications, voice and electronic mail, Internet, and mobile systems. Management issues covered include cost/benefit analysis, org anizational impact, international systems, and emerging technologies.
Prerequisite: BA 325, CS 106.

## BTA 401 - Research (1-6)

(Credit to be arranged.)

## BTA 404 - Internship(1-6)

(Credit to be arranged.)

## BTA 407 -Seminar (1-6)

(Credit to be arranged.) Student-selected problems in information sy stems, quantitative analysis, or operations and materials management to be studied by the individual and discussed in group meeting under direction of academic staff.

## BTA 409 - Practicum(1-12)

(Credit to be arranged.) Field work involving the practice of profes sional activities away from campus.
Prerequisite: consent of instructor.
BTA 410 -SelectedTopics (1-6)
(Credit to be arranged.)

## BTA 415 - Database Management (4)

Introductory database management course for undergraduates in business. The course covers theories of data modeling, techniques for database analy sis, design, development, and implementation; Structured Query Language (SQL), and management of databases. Although all major database management systems, including hierarchical, network, relational, and object-oriented will be covered; the focus will be on relational database systems. Students will learn both the theory and practiceof successful design, development and implementation of databases.

Prerequisite: BTA 350.

## BTA 418 - Client-Server Application Development (4)

Provides an introduction to client server application development with emphasis on the client. Topics include graphical user interface development, event-driven programming, and rapid application development tools. Students will participate in the development of projects using programming languages such as Visual Basic.
Prerequisite:ISQA 360.

## BTA 419 - Business Analytics with Programming (4)

Introduces structured design and programming in order to solve business problems. Through hands-on development using Python programming language, students learn fundamental concepts and implementations of programming relevant to business today. Students will be prepared to understand the nature of coding, what sorts of things are easy or hard to code, what makes coders more or less productive, what sorts of problems arise, and how hard
it is to maintain code. Emphasis will be placed on developing the understanding of business people who manage or work with software developers and programmers. The course focuses on developing skills relevant to the design and developmentof interactive business analytics using Python. Students will learn how to use the principles of programming, especially in Pythonto develop applications for business.
Prerequisite: BTA 350.

## BTA 420 - Systems Analysis and Design (4)

Introduces the foundations of systems analy sis and design (SAD). It examines the scope and organization of the systems de velopment process and the role of the systems development professional. Topics include system requirements, systemanalysis, process and data modeling, implementation, and project management, as well as systems analystskills and competencies. Standard system analys is methods and techniques will be presented and applied. Des igned to give you a generalized, portable, and adaptable understanding of the standardSAD methodology. The purpose of the course is to prepare you, as a business professional, to: [1] understand how SAD techniques are applied in solving business problems, and [2] communicate effectively with information-technology profes sionals on SAD-related is sues.
Prerequisite: BTA 350.

## BTA 424 - LAN Management (4)

Hands-on introduction to the adminis tration of client/server-based local area networks addressing both conceptual and operational as pects of network operating systemmanagement and client operating system configuration. Topics include: design and implementation of network directory services and file systems; network security, backup, and recovery; the implementation and control of dis tributed print services; user access management and environment automation; and remote workstation management.
Prerequisite: BTA 380.

## BTA 426 - Introduction to Decision Technologies (4)

Provides an introduction to the technologies used in aiding decision making in organizations. In addition to the theoretical as pects of decision support, the course exposes students to current technologies. Topics include: human decision making; database technologies for decision support; statistical, analytical, and artificial-intelligence models for decision support; data mining; and on-line analytical processing.
Prerequisite: BTA 415.

## BTA 428 - Data Privacy, Security and Ethics (4)

Examines topics of information privacy and data security that are of fundamental importance in modern
organizations from an ethical lens. The theories, concepts, and practices relating to the deployment and management of information security s ystems, and the collection and use of data. Topics include threat analysis and risk
management; encryption and security technology; data use and reuse, data brokering; and the legal, ethical, and social implications of data-driven environments.
Prerequisite: BTA 350.

## BTA 436 - Advanced Database Administration (4)

Advanced study of dataenvironments, data modeling techniques, database design, query processing, and optimization. Emphas is will be placed on client-server architecture and dataenvironments such as Oracle and SQL Server. Students will participate in databasedesign projects. Other topics will include industry trends and opportunities, and database adminis tration.
Prerequisite: BTA 415.

## BTA 481 - Blockchain Fundamentals (4)

This course introduces the fundamentals of blockchain technology and provides a comprehensive survey of the essential building blocks and unique characteristics of this innovative technology.

Also offered for graduate-level credit as BTA 581 and may be taken only once for credit. Prerequis ite: This course is part of the Business Blockchain Certificate. All students are expected to complete the Blockchain Primer before registering for this course.

## BTA 482 -Blockchain Fundamentals Lab (2)

This course provides practice using technologies that will help students understand the core features of blockchain networks as well as the cryptocurrencies and smart contracts that they enable.
Also offered for graduate-level credit as BTA 582 and may be taken only oncefor credit. Prerequisite: This course is part of the Business Blockchain Certificate. Allstudents are expected to complete the Blockchain Primer before registering for this course.

## BTA 483 - Blockchain in Business (4)

This course explores business uses of distributed ledger technology (DLT), including for transferring value, executing s mart contracts, tracking chain of custody, and verifying identify.
Also offered for graduate-level credit as BTA 583 and may be taken only once for credit. Prerequis ite: This course is part of the Business Blockchain Certificate. All students are expected to complete the Blockchain Primer before registering for this course.

## BTA 484-Blockchain in Business Lab (2)

This course provides extensive hands-on practiceusing distributed ledger technologies and dis cussions about the appropriate uses of relational databases and various permis sioned and permis sionless blockchain systems.
Also offered for graduate-level credit as BTA 584 and may be taken only once forcredit. Prerequisite: This course is part of the Business Blockchain Certificate. All students are expected to complete the Blockchain Primer before registering for this course.

## BTA 485 - Blockchain Uses and Applications (4)

This course explores current and proposed blockchain uses in variety of industries and sectors and enables students to design and develop distributed applications (DApps).
Also offered for graduate-level credit as BTA 585 and may be taken only once forcredit. Prerequisite: This course is part of the Business Blockchain Certificate. All students must complete the Blockchain Primerbefore registering for this course.

## BTA 486 - Emerging Topics in Blockchain (2)

This course explores current and future blockchain innovations and resources available for learning about blockchain developments.

Also offered for graduate-level credit as BTA 586 and may be taken only once forcredit. Prerequisite: This course is part of the Business Blockchain Certificate. All students are expected to complete the Blockchain Primer before registering for this course.

## BTA 506 -Special Projects (1-9)

(Credit to be arranged.)

## BTA 510 - SelectedTopics (1-8)

(Credit to be arranged.)

## BTA 510S -Selected Topics (1-8)

(Credit to be arranged.)

## BTA 513 - Business Decision Tools for Managers (2)

This course builds directly from the on-line Es sentials of Business Decision Tools completed prior to admission to the MBA+ program. Students will gain an in-depth understanding of the fundamental theories, concepts, and principles of quantitative analysis. Topics covered include estimation, hypothesis testing, ANOVA and regression analys is.
Prerequisite: Pre-stats online module.

## BTA 514 -Survey Research Techniques (1)

Focus on business applications for designing, administering and analyzing a survey, such as for market research. This section will build directly from coursework in Mktg 511, Mktg 512 and ISQA 513.
Prerequisite: BTA 513.
BTA 515 -Series andForecasting Techniques (1)
Focus on business applications that incorporate Time Series and Forecasting Techniques, including multiple regression procedures. This section will build directly from coursework in Fin 513 and ISQA 513.
Prerequisite: BTA 513.

## BTA 516 - Multiple Regression with Business Applications (3)

Presents some linear model building andevaluation techniques using multiple regression. The course is org anized around applications to understand related and potentially causal factors in a management context with implications for management decision making. The goal is to construct and interpret regression models according to specified predictor variables that contribute to predicting the unknown value of the response variable of interest. Students who do not have familiarity with basic statistical analyses will be given access to a primer.

## BTA 518 -Electronic Commerce (3)

Survey of technologies and technological applications to conduct business electronically today and in the future. Students will learn about electronic data interchange, the role of technology in electronic markets, the Internet, and the organizational impact of these technologies. Internet based technologies will be presented and used.

## BTA 519 - Managerial Analytics (2-4)

Introduction to the role of " big data analytics" related to strategic decision making. Exploration of concepts fundamental to analytics programs, including data-driven decision making, interpreting and gaining insight from structured data, effective communication of strategic decisions, and managing an analytics team.

## BTA 520 - Introduction to Business Intelligence and Analytics (4)

An overview on leveraging data resources to develop and deploy business strategies to enhance their decisionmaking capabilities so organizations can gain and sustain a competitive advantage. Specifically, the course shows how to discover subtle patterns and associations frombusiness
data and develop and deploy predictive, clustering, and market basket models to optimize decision-making throughout organization.
Prerequisite: Stat 451/ Stat 551 or Stat 461/Stat 561.

## BTA 521 - Data Visualization (2)

An es sential component of Business Intelligence/ Analytics is data visualization. This course prepares students to generate data visualizations with several standard software applications in analytics, and to interpret and communicate the results to an organization's decision makers.
Prerequisite: BTA 520.

## BTA 522 -Special Topics in Data Science, Technology for Business (2)

To do data science in business requires skills in data analys is. Much of the work of data science in business requires the manipulation of datastored in a variety of data structures possible in the R language. Students will learn the basics of the R language for dataanalysis, data visualization, and datamanipulation. Students will expand their skills using R to accomplish applied analy ses with businessdata.

## BTA 523 - Special Topics in Data Science, Machine Learning Applications for Managers (2)

The capability of "machine learning" is literally revolutionizing as pects of society, becoming a major disruptive technology and an important tool in business processes, e.g., sales forecasts, employee retention, inventory control, personalized advertisements, price optimization, and quality control. Students will learn basic machine learning models and understand how such models can contribute to business success.

## BTA 581 - Blockchain Fundamentals (4)

This course introduces the fundamentals of blockchain technology and provides a comprehensive survey of the es sential building blocks and unique characteristics of this innovative technology.
Also offered for undergraduate-level credit as BTA 481 and may be taken only once for credit. Prerequisite: Blockchain primer or equivalent and admitted to a graduate business program. Cross-Listed as: This is the same course as BTA 581S and may be taken only once for credit.

## BTA 581S - Block chain Fundamentals (4)

This course introduces the fundamentals of blockchain technology and provides a comprehensive survey of the es sential building blocks and unique characteristics of this innovative technology.

Also offered for undergraduate-level credit as BTA 481 and may be taken only once for credit. Prerequisite: Blockchain primer or equivalent and admitted to a graduate businessprogram. Cross-Lis ted as: This is the same course as BTA 581 and may be taken only once for credit.

## BTA 582 -Blockchain Fundamentals Lab (2)

This course provides practice using technologies that will help students understand the core features of blockchain networks as well as the cryptocurrencies and smart contracts that they enable.
Also offered for undergraduate-level credit as BTA 482 and may be taken only once forcredit. Prerequis ite: This course is part of the Business Blockchain Certificate. All students are expected to complete the Blockchain Primer before registering for this course. Cross-Listed as: This is the same course as BTA 582S and may be taken only once for credit.

## BTA 582S - Blockchain Fundamentals Lab (2)

This course provides practice using technologies that will help students understand the core features of blockchain networks as well as the cryptocurrencies and smart contracts that they enable.

Also offered for undergraduate-level credit as BTA 482 and may be taken only once forcredit. Prerequis ite: This course is part of the Business Blockchain Certificate. All students are expected to complete the Blockchain Primer before registering for this course. Cross-Listed as:This is the same course as BTA 582 and may be taken only once for credit.

## BTA 583 - Blockchain in Business (4)

This course explores business uses of dis tributed ledger technology (DLT), including for transferring value, executing s mart contracts, tracking chain of custody, and verifying identify.
Also offered for undergraduate-level credit as BTA 483 and may be taken only once forcredit. Prerequis ite: This course is part of the Business Blockchain Certificate. All students are expected to complete the Blockchain Primer before registering for this course. Cross-Listed as: This is the same course as BTA 583S and may be taken only once for credit.

## BTA 583S - Block chain in Business (4)

This course explores business uses of distributed ledger technology (DLT), including for transferring value, executing s mart contracts, tracking chain of custody, and verifying identify.
Also offered for undergraduate-level credit as BTA 483 and may be taken only once for credit. Prerequisite: This course is part of the Business Blockchain Certificate. All students are expected to complete the Blockchain Primer before registering for this course. Cross-Listed as:This is
the same course as BTA 583 and may be taken only once for credit.

## BTA 584 - Block chain in Business Lab (2)

This course provides extensive hands-on practice using distributed ledger technologies and discussions about the appropriate uses of relational databases and various permis sioned and permis sionless blockchain systems.

Also offered for undergraduate-levelcredit as BTA 484 and may be taken only once for credit. Prerequisite: This course is part of the Business Blockchain Certificate. All students are expected to complete the Blockchain Primer before registering for this course. Cross-Listed as:This is the same course as BTA 584S and may be taken only once for credit.

## BTA 584S - Block chain in Business Lab (2)

This course provides extensive hands-on practice using distributed ledger technologies and discussions about the appropriate uses of relational databases and various permis sioned and permis sionless blockchain systems.

Also offered for undergraduate-levelcredit as BTA 484 and may be taken only once for credit. Prerequisite: This course is part of the Business Blockchain Certificate. All students are expected to complete the Blockchain Primer before registering for this course. Cross-Listed as:This is the same course as BTA 584 and may be taken only once for credit.

## BTA 585 - Blockchain Uses and Applications (4)

This course explores current and proposed blockchain uses in variety of industries and sectors and enables students to design and develop distributed applications (DApps).

Also offered for undergraduate-level credit as BTA 485 and may be taken only once for credit. Prerequisite: This course is part of the Business Blockchain Certificate. All students must complete the Blockchain Primer before registering for this course. Cross-Listed as: This is the same course as BTA 585S and may be taken only once for credit.

## BTA 585S - Block chain Uses and Applications (4)

This course explores current and proposed blockchain uses in variety of industries and sectors andenables students to design and develop distributed applications (DApps).
Also offered for undergraduate-level credit as BTA 485 and may be taken only once for credit. Prerequisite: This course is part of the Business Blockchain Certificate. All students must complete the Blockchain Primer before registering for this course. Cross-Listed as: This is the same course as BTA 585 and may be taken only once for credit.

## BTA 586 -Emerging Topics in Blockchain (2)

This course explores current and future blockchain innovations and resources available for learning about blockchain developments.
Also offered for undergraduate-level credit as BTA 486 and may be taken only once forcredit. Prerequisite: This course is part of the Business Blockchain Certificate. All students are expected to complete the Blockchain Primer before registering for this course. Cross-Listed as: This is the same course as BTA 586S and may be taken only once for credit.

## BTA 586S - Emerging Topics in Blockchain (2)

This course explores current and future blockchain innovations and resources available for learning about blockchain developments.

Also offered for undergraduate-level credit as BTA 486 and may be taken only once for credit. Prerequisite: This course is part of the Business Blockchain Certificate. All students are expected to complete the Blockchain Primer before registering for this course. Cross-Listed as: This is the same course as BTA 586 and may be taken only once for credit.

## CCJ - Criminology \& Criminal Justice

## CCJ 199 - Special Studies (1-4)

(Credit to be arranged.) Pass/no pass option.

## CCJ 200 - Criminology and Criminal Justice (4)

An introduction and overview of the criminology and criminal justice major designed to provide students with an understanding of law, crime, and the criminal justice systemin America. Examines the law's proactive function in teaching people how to live peacefully within their communities and the law's reactivefunction in sanctioning criminal behavior. Includes an introduction to various theories of crime causation and an overview of the criminal justice systemand its response in processing those who trans gress the law.

## CCJ 210 - Introduction to Juvenile Justice Process (4)

A general overview of the various activities and decisions involved in the processing of young law violators. Examination of the justice system specially designed to handle children, consideration of the many stages in the system, and considerations of is sues in juvenile justice policy formulation.

## CCJ 230 - Policing in America (4)

An introduction to the study of policing in the United States. Policing is studied from three perspectives: the police officer-citizen interaction, the agency-community relationship, and the legal and ethical questions of policing in a democratic society. The course considers the history and future of policing, the police task, police strategies, and police relationships with the community and criminal justice system.

## CCJ 240 - Punishment and Corrections (4)

Examination of historical and contemporary approaches to the punishment of adult and juvenile offenders in institutional and community settings. Includes discussion of theories of punishment as they relate to today's correctional policies and practices. Controversial topics like prisonerrights, the death penalty, and mandatory sentencing are covered.

## CCJ 260 - Criminal Justice and Popular Culture (4)

This course analyzes mass media products such as news programs and periodicals, music, film, and fictional literature to investigate the representation of crime and criminal justice in popular culture and the media impact on the criminal justice system.

## CCJ 299 - Special Studies (1-4)

(Credit to be arranged) Pass/no pass option.

## CCJ 300 - Criminology and Criminal Justice (4)

An introduction and overview of the criminology and criminal justice major designed to provide students with an understanding of law, crime, and the criminal justice systemin America. Examines the law's proactive function in teaching people how to live peacefully within their communities and the law's reactivefunction in sanctioning criminal behavior. Includes an introduction to various theories of crime causation and an overview of the criminal justice systemand its response in processing those who trans gress the law.

## CCJ 301 - Policing in America (4)

An introduction to the study of policing in the United States. Policing is studied from three perspectives: the police officer-citizen interaction, the agency-community relationship, and the legal andethical questions of policing in a democratic society. The course considers the history and future of policing, the police task, police strategies,
and police relationships with the community and criminal justice system.

## CCJ 303 - Punishment and Corrections (4)

Examination of historical and contemporary approaches to the punishment of adult and juvenile offenders in institutional and community settings. Includes discussion of theories of punishment as they relate to today's correctional policies and practices. Controversial topics like prisoner rights, the death penalty, and mandatory sentencing are covered.

## CCJ 305 - Juvenile Justice Reform (4)

Modern approaches, evolving issues, and best practices for juvenile delinquency prevention and juvenile justice reform are the foci of the course. Students explore identifiers of"at-risk" youths, and the role dis proportionate minority contact, poverty, trauma, mentalhealth disorders, and physical or intellectual dis abilities play in affecting the behavior of juveniles. Examination of past practices like the "school to pris on pipeline" phenomenon that have disproportionately impacted youth fromcommunities of color are critiqued and contrasted with more efficacious and equitable approaches.

## CCJ 310 - American Courts (4)

Comprehensive survey of the role and function of courts in the United States. Emphasis placed on the operations of trial-level courts hearing criminal cases. Explores the roles and duties of courtroomparticipants, structure of the judiciary, relationship between the formal rule of law and daily activities of courts, decision-making, and perspectives from which to view the courts. Attention also to appellate courts, juvenile courts, court reform, and is sues of gender, race, and ethnicity.

## CCJ 312 - Criminal Behavior (4)

Examination of psychosocial theories of crime and identification of the individual-level factors associated with the onset, continuity, and desistance of criminal behavior in juveniles and adults. Special topics covered include the relationship bet ween mental illness and violence, psychopathy, sexual deviancy, substance abuse, human aggression, and the rehabilitation of offenders.

## CCJ 315 - Crime Myths (4)

Crime in various forms is a common topic of conversation among individuals at work, at home, at school and in a variety of other settings. Much of what people believe
about crime, its perpetrators and its victims often does not fit very well with what we can learn from carefulscientific study of crime. Misperceptions about crime and justice are commonly fostered by the media, political leaders, and from overgeneralizations of personal experience. This course will introduce students to the value of rigorous research evidence as the primary way to identify the existence of crime myths.

## CCJ 317 - Race, Crime, and Criminal Justice (4)

Racial disparity is a major focus of the field of criminology and criminal justice. This course provides an understanding of the tools used to describe, theoretically explain, and empirically examine the complexrelationship between race, crime, and victimization in the United States. The course focuses on all major racial and ethnic groups who are disproportionately justice-impacted-including both victims and offenders. The influence of race at all stages of the criminal justice systemis examined.

## CCJ 320U- Theories of Crime \& Justice (4)

An overview of historical, sociological, biological, psychological, economic, and Marxist theories of crime causation. Particular attention is made to critically analyzing each theory presented in terms of its internal consistency and logic as well as its fit with data on crime, criminals, and victims. Policy implications stemming from these theories will be discussed.

## CCJ 325U- Crime in the City (4)

Crime is a relatively rare event. Urban crimes, in particular, tend to happen in specific and predictable locations. In this class, we introduce a set of criminological theories that explore the role that city structure plays in influencing human behavior and shaping where crime events occur. By understanding both where and why crimes concentrate in specific locations, we are able to introduce approaches for addressing and preventing these crime concerns. Throughout this course, we use our own routines and experiences to understand how environmental crime theories apply within our own lives.

## CCJ 330U - Crime Control Strategies (4)

An analysis of the methods used to control crime in American society. Emphasis on understanding the sometimes conflicting goals of the criminal justice sy stem; attention is given to the general categ ories of general and specific deterrence, ag gressive enforcement, situational and environmental defensive measures, and modification of the social order. Special attention will be given to how
other countries control crime and the problems of comparis on because of political and cultural differences.

## CCJ 335 - Understanding Crime Hotspots (4)

Criminal events are notuniformly distributed across space; nor are such events randomly patterned. Rather, crime and disorder patterns tend to concentrate in specific places and at specific times. In addition, crime is a relatively rare event, meaning that most locations experience little to no occurrences. By exploring where and when crime concentrates, we can learn more about why crime occurs at these locations, and importantly, we can learn how to prevent future occurrences. Understanding Crime Hotspots brings the geographic concepts of space and place into the context of criminology.

## CCJ 336 - Applied Crime Mapping (4)

Introduces the technical and analytical skills used in crime mapping using Geographic Information Systems (GIS) - a combination of hardware and software used to map spatial patterns. In this course, we develop and build the skills needed to interpret, create, analyze and communicate spatial patterns of crime. We consider what features make a useful crime map by critically analyzing existing maps of crime patterns, identifyingelements that aid in clear communication and easy interpretation, and apply these features in crime maps made for presentation, communication and analysis.

## CCJ 340 - Crime Analysis (4)

An introduction to the basic methods used in analyzing data fromcriminal justice agencies, including temporal and spatial analysis of crime patterns, calculation of crime rates, descriptive analyses of victimand offender characteristics, recidivis $m$, and the identification of offense typologies. Students get hands-on experience coding, analyzing, interpreting, and presenting crime data froma number of sources like police homicide reports, the FBI, Department of Corrections, and attitudinal surveys.

Prerequisite: CS 105 or basic computing skills.

## CCJ 345 - Human Behavior and the Law (4)

As the study of human behavior, psy chology must include the study of law, which is a primary instrument used by society to controlhuman behavior. The law makes many as sumptions about human behavior - are they accurate? This course concerns the application of behavioral science research and practice to the legal system.

## CCJ 350U Ethical Leadershipin Criminal Justice (4)

Ethical leadership is a topic of longstanding theoretical and practical importance for the criminal justice system. Criminal and social justice issues are deeply embedded in the social fabric of the community andethical leadership is sues frequently have ramifications beyond the boundaries of our discipline. Students will be taught to recognize, understand, and analyze the significance ofethical leadership forthe criminal justice systemand the community within which it exists.

## CCJ 355U- Perspectives on Terrorism (4)

A survey of international and domestic terroris $m$, the organizations, philosophies, key players, counter-terror organizations, and response. Investigation of the social, psychological, cultural, his torical, political, religious, and economic dynamics of the phenomena will provide preparation for discussion of possible approaches to control.

## CCJ 360 - Victimology (4)

Provides a comprehensiveoverview of the study of victims of crime. This includes research on the process, etiology and consequences of criminal victimization. The criminal justice's response to crime victims, both historically and more recently, will be dis cussed in terms of the changing role of victims in the criminal equation. Topics covered may include restorative justice, restitution, and mediation programs now offered through the criminal justice system.

## CCJ 365U - Criminology and Social Justice Theory (4)

Begins with an analysis of critical criminology theories and their underlying as sumptions. Explores the connections between critical criminology and social justice, the social justice movement, and the communities wherein social justice is practiced. Application of social justice theory to criminaljustice policy and practicehas created a new set of social response mechanis ms to crime and delinquency: mediation, restitution, and restorative justice.

## CCJ 370U - Women, Crime, and Justice (4)

Women as criminals, victims, and professionals in the criminal justice systemare the focus of this course. Theories, policies, and relevant empirical studies will be discussed in the context of the historical, socio-political, and cultural forces that shaped them. Topics may include: girls in gangs, female police officers, mothers behind bars, domestic violence, and pregnancy and drug use.

## CCJ 375U- Global Perspectives on Crime and Justice (4)

An exploration of international criminal justice systems that compares and contrasts the general features and cultural foundations of criminal justice procedures and institutions in different countries throughout the world.

## CCJ 380 - Criminal Justice Research (4)

Introduction to the basic concepts of social science research including hy pothesis testing, research design, causality, sampling, and measurement. Course is intended to provide students with necessary skills to critically evaluate crime and delinquency research as well as design and implement basic research projects.

## CCJ 390U- Crimes of the Powerful (4)

Crimes committed by persons of respectability and high social status as opposed to traditional "street crimes" normally highlighted in criminology and criminal justice courses. White collar corporate, governmental, and occupational crime examples include: violations of environmental, safety, health, and labor laws; finance crimes; corporate abuses of power; fraud; crimes of globalization; and violations of the public trust. Final course section covers law, regulating, policing, prosecuting, adjudicating, and responding to challenges of white collar crime.

## CCJ 399 - Special Studies (1-9)

(Credit to be arranged) Pas s/no pass option.

## CCJ 399U- Special Studies (4)

(Credit to be arranged) Pas s/no pass option.

## CCJ 401 - Research (1-6)

(Credit to be arranged) Consent of instructor

## CCJ 402 - Independent Study (1-4)

(Credit to be arranged) Consent of ins tructor.

## CCJ 403 - Thesis (1-12)

(Credit to be arranged.)

## CCJ 404 - Cooperative Education/Internship (1-12)

(Credit to be arranged) Supervised placement in a community criminal justice agency or on a criminal justice research project. Evaluations of students are completed by agency staff and/or University faculty. A minimum of 8 credits is required ofCCJ majors. An additional 8 credits can be applied toward CCJ elective credits required of majors. Required: senior status and consent of instructor.

## CCJ 405 - Reading and Conference (1-6)

(Credit to be arranged) Consent of instructor.

## CCJ 406 - Projects (1-8)

(Credit to be arranged) Consent of instructor.

## CCJ 407 - Seminar (1-8)

(Credit to be arranged) Consent of instructor.

## CCJ 409 - Senior Practicum(0-16)

(Credit to be arranged) Consent of instructor and senior status.

## CCJ 410 - Selected Topics (1-8)

(Credit to be arranged) Pass/no pass option.

## CCJ 415 - Counseling Skills for Criminal Justice (4)

A practice-oriented course covering the basic interviewing, as sessment, and counseling skills routinely used by profes sionals in the criminal justice field (e.g., police, correctional staff, probation officers, prosecutors). Includes coverage of techniques for developing rapport with clients, soliciting information, screening for mental illness, threat/risk as sessment, and crisis intervention.

## CCJ 420 - Criminal Law and Legal Reasoning (4)

Study of the basic concepts related to criminal law, including: historical development, legal elements of crime and proof, defenses and mitigation, reas onable doubt, and presumptions of fact; with particular emphasis on the application of logical reasoning to make legaldecisions.
Prerequisite: Senior status.
CCJ 435 - Crime, Grime and Fear (4)
Crime, grime, and fear is a course designed to study the social, economic, political, and physical factors underlying
neighborhood crime and decline. Special attention is given to physical and social incivilities, the "broken windows" theory, police-community partnerships, and problemsolving. Students will work on neighborhood-centered projects to explore solutions to neighborhood crime patterns, disorder, and fear of crime, and ideas for strengthening police-citizen relations, and community building.

## CCJ 480 - Community-based Treatment of Offenders (4)

An analysis of the history, philosophy, theory, and function of probation, parole, pardon, halfway houses, work release centers, and other forms of community-based treatment; evaluation of the effectiveness of treatment of the offender in the community; contemporary usage of the presentence investigation report, selection, supervision, and release of probationers and parolees; exploration of current innovations in corrections such as useof volunteers and offenders as correctional manpower res ources.

Also offered for graduate-level credit as CCJ 580 and may be taken only once for credit.

## CCJ 485 - Offender Rehabilitation (4)

Examines the history of the rehabilitative ideal in corrections. Students will develop an understanding of as sessment and classification systems, treatment programs, as well as evidence-based theories and approaches to the treatment of offenders. Finally, this course willconsider how correctional programs should be implemented, monitored and evaluated.
Prerequisite: Sophomore Standing.

## CCJ 501 - Research (1-9)

(Credit to be arranged) Consent of instructor.

## CCJ 502 - Independent Study (1-8)

(Credit to be arranged) Consent of instructor.

## CCJ 503 - Thesis (1-9)

(Credit to be arranged)

## CCJ 504 - Cooperative Education/Internship (1-9)

(Credit to be arranged) Supervised placement in a community criminal justice agency or on a criminal justice research project. Evaluations of students are completed by agency staff and/or University faculty. A minimum of 8 credits is required of CCJ majors. An additional 8 credits
can be applied toward CCJ elective credits required of majors. Required: senior status and consent of instructor.

## CCJ 505 - Reading and Conference (1-6)

(Credit to be arranged) Consent of instructor.

## CCJ 506 - Projects (1-12)

(Credit to be arranged) Consent of instructor.

## CCJ 507 - Seminar (1-6)

(Credit to be arranged) Consent of instructor.

## CCJ 508 - Workshop(1-8)

(Credit to be arranged) Consent of instructor.

## CCJ 509 - Graduate Practicum(1-8)

(Credit to be arranged.)

## CCJ 510 - Special Topics (1-8)

(Credit to be arranged) Pass/no pass option.

## CCJ 511 - Historical Perspectives of Criminal Justice

 (3)A chronological survey of significant social events and trends in Western and Eas tern civilizations that have influenced crime and the development of law, the police, the courts, and corrections and have formed the interrelationships among these parts of the criminal justice system.

## CCJ 512 - Institutions of the Criminal Justice System

 (3)Introduces students to the complex relationship between the three formal institutions (police, courts, and corrections), how their agents work to achieve various goals, and the multifaceted impact of such efforts.

## CCJ 513 - Professional Orientation in Criminology and Criminal Justice (3)

Designed for development of graduate-level writing proficiency and a general orientation to the discipline. Through lectures, discussion, workshops, and practical
application students will refine grammar, conventions, organization, citations, and research expertise. Students will also be introduced to the Criminal Justice Department faculty and their particular research interests. Finally, the students will be oriented to the ways in which the discipline is organized and how specific sub-areas fit together.

## CCJ 515 - Theories of Crime and Justice (3)

An overview of historical, sociological, biological, psychological, economic, and Marxist theories of crime causation. Particular attention is given to analyzing each theory presented in terms of its internal consistency and logic as well as its fit with data on crime, criminals, and victims. Students will have to test the effectiveness of these individual theories through the research literature available in the criminal justice literature. Policy and programmatic implications stemming fromthese theories and what the research literature indicates will be discussed in class.

Also offered as CCJ 615 and may be taken only once for credit.

## CCJ 520 - Analysis of Crime and Justice Data (3)

An applied approach to the analysis of criminal justice data. Includes an overview of the collection, storage, and retrieval of data from various sources (e.g., police, courts, corrections). Bas ic techniques commonly used to analyze and present criminal justice data are covered with an emphas is on the useofempirical findings to solve problems and develop policy. Advanced statistical procedures introduced.

Also offered as CCJ 620 and may be taken only once for credit.

## CCJ 521 - Advanced Regression in Criminology \& Criminal Justice (3)

An applied approach designed to give you a comprehensive overview of the analysis of criminal justice data using some of the most commonly used regression techniques utilized by criminology and criminal justice researchers. This course introduces a number of useful statistical models that move beyond standard linear regression. Among the topics covered are logit and probit models for both binary and ordinal dependent variables, event count models, mixed models including HLM and panel models, factor analysis, and structural equation modeling in the context of CCJ data.
Prerequisite: CCJ 520.

## CCJ 525 - Criminal Justice Theory (3)

This course introduces students to the theoretical work on criminal justice process, decision-making, and discretion using multiple disciplinary perspectives. Topics discussed
include examination of the stages of the justice process and theoretical approaches to studying in dividual, org anizational, system, and political behavior. Emphasis is placed on the practical utilization of theory to inform development of research problems.
Also offered as CCJ 625 and may be taken only once for credit.

## CCJ 530 - Criminal Justice Research (3)

The purpose of the course is to familiarize students with typical research methods used in the study of criminology and criminal justice along with their resulting databases. This knowledgebase will be used as a foundation upon which to teach students how to critically research in criminology and criminal justice. Expected preparation: CCJ 520.

Also offered as CCJ 630 and may be taken only once for credit.

## CCJ 535-Criminal JusticePolicy (3)

An advanced course in criminal justice policy analysis. Course examines the development, implementation, and outcomes of interventions designed to impact crime and the criminal justice system. Theories of criminal justice intervention will be studied across multiple levels: individual, organizational, commu nity, and system. Emphas is is placed on the utilization of research findings to inform criminal justice policy and future research. Expected preparation: CCJ 520 and CCJ 530.

Also offered as CCJ 635 and may be taken only once for credit.

## CCJ 540 - Legal Perspective of Criminal Justice (3)

An advanced course that examines the legal environment within which the criminal and quasi-criminaljustice systems function, with particular emphasis on philosophical and procedural is sues related to deprivation of liberty decisions.
Also offered as CCJ 640 and may be taken only once for credit.

## CCJ 541 - Evidence BasedPractices in Criminal Justice (4)

Analyzes the scientific and theoretical bases of effective criminal justice practices. Application of evidence-based principles and findings to address problems specific to policing, courts, corrections, juvenile justice, or crime prevention. May be repeated once.

Also offered as CCJ 641.
CCJ 545 - Advanced Topics in Research Methods (3)
Advanced training in select research methodologies practiced in criminology and criminal justice. Topics may include, but are not limited to; survey methods, field
methods, advanced statistics, advanced crime analy sis, content and document analysis, evaluation research, secondary data analysis, and interviews. Topics will vary yearly. May be repeated once.
Also offered as CCJ 645. Prerequisite: CCJ 520 and CCJ 530.

## CCJ 546 - Contemporary Problems in Criminal Justice

 (4)Critical analys is of contemporary criminal justice problems. Examines the effect of legal, structural, political and cultural factors on criminal justice responses to social problems. Topic of focus varies. May be repeated once.
Also offered as CCJ 646.

## CCJ 552 - Crime, Space and Time (3)

Crime is a rare event, concentrating in both space, and time. In Crime, Space and Time, we will introduce, critically examine, and apply the criminological theories that help us to understand why crimes concentrate where and when they do. Designed for the beginning crime analyst, this course provides students with the theoretical foundations of spatial-temporal criminology needed in order to develop practical and applied skills within the field. Students will learn about the interconnections between spatial-temporal theories of crime, and applied crime analysis.

## CCJ 555- Crime Mapping (3)

Mapped information has become an important part of daily urban life. Maps are also increasingly used within policing environments to dis play and disseminate information about crime patterns, to identify crime concentrations, and to analyze existing or projected crime hots pots. In Crime Mapping, students will be introduced to spatial crime analys is and Geographic Information Sy stems (GIS). Students learn es sential principles of cartography and geography, as these fields apply to crime analysis. Participants learn how to collect, clean, geocode, analyze and present spatial crime data.

## CCJ 580 - Community-based Treatment of Offenders (3)

An analysis of the history, philosophy, theory, and function of probation, parole, pardon, halfway houses, work release centers, and other forms of community -based treatment; evaluation of the effectiveness of treatment of the offender in the community; contemporary usage of the presentence investigation report, selection, supervision, and releaseof probationers and parolees; exploration of current innovations in corrections such as useof volunteers and offenders as correctional manpower res ources.

## CCJ 585 - Crimes of the Powerful (3)

Advanced study of white collar crime and deviance including corporate, governmental, occupational, and professional/organized criminalbehavior. Examples include: violations of en vironmental, safety, health, and labor laws; finance crimes; corporate abuses of power, fraud, and economic exploitation; cybercrimes, crimes of globalization; and violations of the public trust. The final class section will delve deeply into law and the social control of white collar crime; regulating and policing white-collar crime; and prosecuting, adjudicating, and public policy responses to white collar crime.

## CCJ 601 - Research (1-9)

(Credit to be arranged) Consent of instructor.

## CCJ 602 - Independent Study (1-8)

(Credit to be arranged) Consent of instructor.

## CCJ 604 - Internship(1-9)

(Credit to be arranged) Supervised placement in a community criminal justice agency or on a criminal justice research project. Evaluations of students are completed by agency staff and/or University faculty. A minimum of 8 credits is required ofCCJ majors. An additional 8 credits can be applied toward CCJ elective credits required of majors. Required: senior status and consent of instructor.

## CCJ 605 - Reading and Conference (1-6)

(Credit to be arranged) Consent of instructor.

## CCJ 606 - Projects (1-12)

(Credit to be arranged) Consent of instructor.

## CCJ 607 - Seminar (1-6)

(Credit to be arranged) Consent of instructor.

## CCJ 608 - Workshop(1-8)

(Credit to be arranged) Consent of instructor.

## CCJ 609 - Graduate Practicum(1-8)

## CCJ 610 - Special Topics (1-4)

(Credit to be arranged.) Consent of instructor.

## CCJ 615 - Theories of Crime and Justice (3)

An overview of historical, sociological, biological, psychological, economic, and Marxist theories of crime causation. Particular attention is given to analyzing each theory presented in terms of its internal consistency and logic as well as its fit with data on crime, criminals, and victims. Students will have to test the effectiveness of these individual theories through the research literature available in the criminal justice literature. Policy and programmatic implications stemming fromthese theories and what the research literature indicates will be discussed in class.

Also offered as CCJ 515 and may be taken only once for credit.

## CCJ 620 - Analysis of Crime and Justice Data (3)

An applied approach to the analysis of criminal justice data. Includes an overview of the collection, storage, and retrieval of data from various sources (e.g., police, courts, corrections). Bas ic techniques commonly used to analyze and present criminal justice data are covered with an emphas is on the useofempirical findings to solve problems and develop policy. Advanced statistical procedures introduced.

Also offered as CCJ 520 and may be taken only once for credit.

## CCJ 625 - Criminal Justice Theory (3)

This course introduces students to the theoretical work on criminal justice process, decision-making, and discretion using multiple disciplinary perspectives. Topics discussed include examination of the stages of the justice process and theoretical approaches to studying individual, org anizational, system, and political behavior. Emphasis is placed on the practical utilization of theory to inform development of research problems.

Also offered as CCJ 525 and may be taken only once for credit.

## CCJ 630 - Criminal Justice Research (3)

The purpose of the course is to familiarize students with typical research methods used in the study of criminology and criminal justice along with their resulting databases. This knowled ge base will be used as a foundation upon which to teach students how to critically research in criminology and criminal justice. Expected preparation: CCJ 620.

Also offered as CCJ 530 and may be taken only once for credit. .

## CCJ 635 - Criminal JusticePolicy (3)

An advanced course in criminal justice policy analysis. Course examines the development, implementation, and outcomes of interventions designed to impact crime and the criminal justice system. Theories of criminal justice intervention will be studied across multiple levels: individual, organizational, community, and system. Emphas is is placed on the utilization of research findings to inform criminal justice policy and future research. Expected preparation:CCJ 620 and CCJ 630.
Also offered as CCJ 535 and may be taken only once for credit. .

## CCJ 640 - Legal Perspective of Criminal Justice (3)

An advanced course thatexamines the legal environment within which the criminal and quasi-criminaljustice systems function, with particular emphasis on philosophicaland procedural is sues related to deprivation of liberty decisions.
Also offered as CCJ 540 and may be taken only once for credit.

## CCJ 641 - Evidence BasedPractices in Criminal Justice

 (4)Analyzes the scientific and theoretical bases of effective criminal justice practices. Application of evidence-based principles and findings to address problems specific to policing, courts, corrections, juvenile justice, or crime prevention. May be repeated once.
Also offered as CCJ 541.
CCJ 645 - Advanced Topics in Research Methods (3)
Advanced training in select research methodologies practiced in criminology and criminal justice. Topics may include, but are not limited to; survey methods, field methods, adv anced statistics, advanced crime analysis, content and document analysis, evaluation res earch, secondary data analysis, and interviews. Topics will vary yearly. May be repeated once.
Also offered as CCJ 545. Prerequisite: CCJ 520 and CCJ 530.

CCJ 646 - Contemporary Problems in Criminal Justice (4)

Critical analys is of contemporary criminal justice problems.Examines the effect of legal, structural, political and cultural factors on criminal jus tice res ponses to social problems. Topic of focus varies. May be repeated once.
Also offered as CCJ 546.

## CE - Civil \& Environmental Engineering

CE 111 - Introduction to Civil and Environmental Engineering (3)
Introduction to Civil and Environmental Engineering (CEE) through interaction with practicing professionals, upperclass mentors, and professors in CEE. This course will consider thehistory, ethical concepts, sustainability is sues, and communication in CEE. Lectures and laboratory. CBL course.

Corequisite: CE111L.
CE 111L - Introduction to Civil and Environmental Engineering Lab (0)
Lab for CE 111.
Corequisite: CE111.
CE 112-Civil and Environmental Engineering Computations (3)
Computational techniques in Civil and Environmental Engineering. Development of mathematical techniques to solve engineering problems. Use of statistical and graphical techniques to presentengineering data. Introduction to data visualization and computer programming techniques in engineering. Lectures and laboratory.

Corequisite: CE 112L.
CE 112L-Civil and Environmental Engineering Computations Lab (0)
Lab for CE 112.
Corequisite: CE112.
CE 115 - Civil Engineering Drawing and Spatial Analysis (3)
The graphic language applied to civilengineering. Projection systems. Multiview and pictorial representation. Introduction to computer assis ted drawing software, geographic information systems and spatial analysis. Lecture and laboratory.

Corequisite: CE 115L.
CE 115L-Civil Engineering Drawing and Spatial Analysis Lab (0)
Lab for CE 115
Corequisite: CE115.
CE 199 - Special Studies (1-3)
(Credit to be arranged.) Consent of instructor.
Corequisite: CE 199L.

## CE 211 - Plane Surveying and Mapping (3)

An introductory analytical treatment of the principles of engineering meas urements applied to plane surveys. Origin of datums, randomerror, observation systems, computations, nonrigorous adjustments, and topographic mapping. Computer applications.

Prerequisite: Mth 251. Corequisite: CE 212.

## CE 212 - Field Problems in Plane Surveying (1)

CE 212: Care and operation of planes urvey instruments. Field projects in testing instrumental adjustment and executing basic survey circuits. CE213: Development and completion of a topographic map by field method. CE 214: Layout of a route design; adjustment of optical instruments. Elementary field astronomy. This is the first course in a sequenceof three: CE212, CE 213, and CE 214.

Prerequisite: CE211 concurrently. Corequisite: CE 211.

## CE 299 - Special Studies (1-12)

(Credit to be arranged.)

## CE 315 - The Civil and Environmental Engineering Profession (1)

Introduction to civil and environmental engineering (CEE) practice in structural, environmental, geotechnical, and trans portation engineering. Overview of education, training, research, and employ ment opportunities for each area of CEE. Engineering registration and ethics.

Prerequisite: junior standing in CEE.
CE 316 - Applied Probability and Statistics for Civil \& Environmental Engineering (4)
Application of probability distributions, hypothesis testing and regression modeling with an emphasis on formulating and solving real-world problems using software thatcan be readily available to students now and later in the professional world. Focus on probabilistic and reliable, sustainable, and equitable design and operation of civil infras tructure and environmental systems.
Prerequisite: Mth254, Admis sion to the Program.

## CE 321 - CEE Properties of Materials (4)

Introduction to structure and properties of civilengineering materials such as steel, asphalt, cement, concrete, soil, wood and polymers. Laboratory tests include evaluation of behavior of these materials under a wide range of conditions. Lectures and laboratory.

Prerequisite: EAS 212. Corequisite: CE321L.
CE 321L - Lab for CE 321 (0)
Lab for CE 321.

Corequisite: CE321.

## CE 324 - Elementary Structural Analysis (4)

Loads on structures as dictated in various codes and specification; load flow through a structural systemand tributary areas; methods of analysis of statistically determinate planar trusses, beams, and frames; concepts of stability and indeterminacy; axial, shear, and bending moment; calculations of dis placements and rotations by virtual work, Castigliano's theoremfor trus ses, beams and frames; computer analy sis of structures using an existing commercial program.

Prerequisite: Completion of EAS 212 and Mth 261 with a C or better.

## CE 325 - Indeterminate Structures (4)

Analysis of indeterminate structures by force and displacement methods; consistent deformations and the theoremof least work; slope deflection; moment distribution including s way; approximate methods.

Prerequisite: CE324.

## CE 341 - Soil Classification and Properties (4)

Determination and interpretation of significant engineering properties and behavior of soils; selected application in mechanics of foundations and earth structures. Three lectures; one 3-hour laboratory period.
Prerequisite: CE321. Corequisite: CE 341L.
CE 341L - Soil Classification and Properties Lab (0)
Lab for CE 341 Soil Classification and Properties.
Corequisite: CE341.

## CE 345 - Environmental Soil Mechanics (2)

Introduction to the description, classification and significant en gineering properties of soils for environmentalmajors.Emphas is on indexproperties, permeability and flow nets.
Prerequisite: EAS 212. Corequisite: CE345L.
CE 345L - Environmental Soil Mechanics Lab (0)
Lab for CE 345.
Corequisite: CE345.

## CE 351 - Introduction to Transportation Engineering (4)

A study of engineering problems associated with the planning and design of urban and intercity transportation with emphas is on systems approach to problemdefinition and solution. Vehicle operational characteristics and traffic control devices for land, air, and water, data collection methods and development of transportation models for the
es tablishment of design criteria for trans portation structures.

Prerequisite: CE316.
CE 361 - Fluid Mechanics (4)
Properties of fluid; fluid statics; fluid dynamics; control volume and Reynolds transport theorem; conservation of mass, momentumand energy; differential analysis; rotational and irrotational flows, non-viscous and viscous flows, Navier Stokes equations. 3 units Lecture and 1 unit laboratory.

Prerequisite: EAS 215 and Mth 256. Corequisite: CE 361L.

## CE 361L - Fluid Mechanics Lab (0)

Lab for CE 361 Fluid Mechanics.
Corequisite: CE361.

## CE 362 - Engineering Hydraulics (4)

Application of the principles of fluid mechanics to flow in closed conduits, turbomachinary and open channels. Topics include flow res is tance, laminar and turbulent flow and introduction to boundary layer theory; flow in press urized closed conduits including pipes in series and parallel; turbomachinary including pump systems and turbines; uniformand non-uniformflow in open channels, gradually and rapid varied flow; dimensional analysis and similitude. 3 units lecture and 1 unit laboratory.
Prerequisite: CE361. Corequisite: CE 362L.

## CE 362L - Hydraulics Lab (0)

Lab for CE 362 Hydraulics.

## CE 364 - Water Res ources Engineering (4)

Principles of hydrology and hydraulic engineering applied to water supply systems design. Collection and distribution, pump stations, water quality and treatment, economic considerations.

Prerequisite: CE362.

## CE 371 - Environmental Engineering (4)

Effect of air, land, and water pollutants on environment. Transport and fate of pollutants in en vironment. Flow and mass balances of reactors. Reaction kinetics. Mathematical modeling of water quality in rivers, lakes, and estuaries. Water and wastewater treatment processes. Air quality management. Solid waste management.
Prerequisite: Ch 222, Ch 228, and CE 361.
CE 399 - Special Studies (1-6)
(Credit to be arranged.)

## CE 399L - Special Studies Lab (0)

Specialstudies lab. (Credit to be arranged.)

CE 401 - Research (1-6)
(Credit to be arranged.) Consent of instructor.

## CE 403 - Honors Thesis (1-4)

(Credit to be arranged.) Consent of instructor.

## CE 404 - Cooperative Education/Internship (1-12)

(Credit to be arranged.) Consent of instructor.

## CE 405 - Reading and Conference (1-6)

(Credit to be arranged.) Consent of instructor.

## CE 406 - Special Projects (1-6)

(Credit to be arranged.) Consent of instructor.

## CE 407 - Seminar (1-6)

(Credit to be arranged.) Consent of instructor. Up to 3 credits of Seminar courses are allowed; further seminars must be approved by the Department prior to registration.

## CE 410 - Selected Topics (0-6)

(Credit to be arranged.) Consent of instructor.

## CE 411 - Law \& Civil/Environmental Engineering (4)

Overview of legal is sues relevant to civil and environmentalengineers, including contract law, environmentallaw, profes sional liability/negligence, and property law. This course willconsider legal decisions, statutes and administrative rules, and case studies relevant to the practice of civil and environmental engineering.

Also offered for graduate-level credit as CE511 and may be taken only once for credit. Prerequis ite: Senior-standing in BSCE, BSENVE, or CEEV.

## CE 412 - Sustainability in Civil \& Environmental Engineering Seminar (1)

This course features seminar speakers discussing sustainable practices in the broad discipline of engineering,
and optimal collaborations in pursuit of that goal.
Examples topics include green building design for zero net energy, urban heat management and minimization, "green vs. "gray" in waste water treatment, and feasibility of energy frombiomass.
Also offered for graduate-level credit as CE512. Prerequisite: CE 362 or CE 341 orCE 454 or CE 325.

## CE 414 - Transportation Seminar (1)

This weekly seminar features a different speaker each week covering various topics in transportation research and practice. The topics cover all modes of transportation, with a focus on current practice. This course may be taken for credit up to three times.
Also offered for graduate-level credit as CE514. CrossListed as: This is the same course as USP 414.
CE 416 - Forensic Structural Engineering (2)
Application of engineering principles to investigate failures and performance problems of structures; case studies and examples of actual structural failures.

Also offered for graduate-level credit as CE516 and may be taken only once forcredit. Prerequisite: CE 434 and CE 432 and CE 437.

## CE 417 - Timber Design (4)

Design of solid and glued-laminated beams, columns and arches; shear walls and diaphragms; connections; design provisions for wind and seismic forces.
Also offered for graduate-level credit as CE517 and may be taken only once forcredit. .Prerequisite: CE325.

## CE 419 - Bridge Engineering (4)

Introduction to analysis and design of short to medium span highway bridges, including load descriptions, analysis and design procedures outlined in AASHTOLoad Resistance Factor Design specifications.
Also offered for graduate-level credit as CE519 and may be taken only once for credit. . Prerequisite: CE325.

## CE 421 - Theoretical and Computational Soil Mechanics (4)

Presents a theoretical framework for soil properties and soil behavior. Topics include Cauchy stress tensors, Hooke's elastic theory, plasticity theory, Mohr-Coulomb soil model, and modified Cam clay elas to-plastic soil model. Part of the course uses computer simulations of geotechnical laboratory tests with FLAC software to apply geomechanical theory.
Also offered for graduate-level credit as CE521 and may be taken only oncefor credit. Prerequisite: CE 341.

## CE 423 - Vibration Analysis in Structural Engineering (4)

Fundamentals of vibration theory; applications in structural engineering. Free, forced, and transient vibration of single and multi-degrees of freedom systems including damping, normal modes, coupling, and normal coordinates.

Also offered for graduate-level credit as CE523 and may be taken only once for credit. . Prerequisite: EAS 212 and Mth 261.

## CE 431 - Stability of Structures (4)

Study of elastic and inelastic flexural buckling of bars and frames; use of energy methods and successive approximations; bracing of columns and frames; tors ional, lateral-torsional, and local buckling.
Also offered for graduate-levelcredit as CE531 and may be taken only once for credit. . Prerequisite: CE432, Mth 261 or equivalent.

## CE 432 - Structural Steel Design (4)

Design of components of steel structures based on allowable strength design and load and resis tance factor design methods.
Also offered for graduate-level credit as CE532 and may be taken only once for credit. . Prerequisite: CE321 and CE 325.

## CE 433 - Cold-Formed Steel Design (4)

Design of cold-formed steel beams, columns, beamcolumns, cy lindrical tubular members, and connections based on the Allowable Stress Design (ASD) and the Load and Resistance Factor Design (LRFD) methods of the AISI specification.
Also offered for graduate-levelcredit as CE533 and may be taken only once for credit. . Prerequisite: CE432.

## CE 434 - Principles of Reinforced Concrete (4)

Loads, load factors and structural safety, ultimate strength analys is; short column behavior, design of simple and continuous beams; one-way slabs; serviceability and detailing requirements with reference to current codes.
Prerequisite: CE321 and CE 325.

## CE 435 - Design of Reinforced Concrete Structures (4)

Development and splicing of reinforcement; design of long columns, retaining walls, footings, and slabs with reference to current codes; lateralloads; laboratory demonstration of beamand column behavior.

Also offered for graduate-level credit as CE535 and may be taken only once for credit. . Prerequis ite: CE434.

## CE 436 - Mas onry Design (3)

Materials of construction; design of mas onry elements, lateral load res isting systems, and connections with reference to current codes.
Also offered for graduate-level credit as CE536 and may be taken only once for credit. .Prerequisite: CE434.

## CE 438 - Design of Composite Structures (4)

Design of composite steel-concrete members based on allowable stress design and load and resistance factor design methods.

Also offered for graduate-level credit as CE538 and may be taken only once forcredit. .Prerequisite: CE432.

## CE 440 - Geosynthetics in Infrastructure Engineering (2)

Testing and design with polymer-based geosynthetic products in and on soil for the civil infras tructure. Strength-based design applications are introduced with design-by-function principles, and product approval for transportation, structural, and geotechnical disciplines. Use of geotextiles, geogrids, and geo-composites in slopes, mechanically stabilized earth retaining walls, pavement subgrades, and overlays.

Also offered for graduate-level credit as CE540 and may be taken only oncefor credit. .Prerequisite: CE444.

## CE 442 - In Situ Behavior and Testing of Soils (4)

Introduction to field behavior of soils related to engineering properties; site investig ation procedures and in situ testing. Development of fundamental analytical solution techniques for engineering with soil, the use and limitations of elasticity as sumptions. Three lectures, one 3hour laboratory period.

Also offered for graduate-level credit as CE542 and may be taken only onceforcredit. .Prerequisite: CE341.
CE 443 - Introduction to Geotechnical Earthquake Engineering (4)
This course introduces basics of geotechnical earthquake engineering. Topics include earthquake characteristics, attenuation relationships, fundamentals of soil liquefaction, semi-empirical procedures for liquefaction trig gering as sessment for cohesionless soils, consequences of liquefaction, cyclic softening of cohesive soils, liquefaction mitigation techniques, and current research on liquefaction modeling.
Also offered for graduate-level credit as CE543 and may be taken only oncefor credit. .Prerequisite: CE341.

## CE 444 - Geotechnical Design (4)

Effect of soil conditions upon the behavior and choice of type of foundation; study of earth pressure theories; design of foundations and earth-retaining structures.
Prerequisite: CE341.
CE 445 - Geo-environmental Engineering with Geosynthetics (2)

Application of polymer-based geosynthetic products for geo-environmental and municipal engineering including landfills, soil erosion control, filters, and drains. Testing, design, and product selection for hydraulic, degradation, and chemical stability properties. Introduction to reliability, endurance, and design life with reference to RCRA, ESA, and EPA laws.
Also offered for graduate-level credit as CE545 and may be taken only once for credit. . Prerequisite: CE341.

## CE 447 - Slope Stability Analysis (4)

Covers soil strength as it relates to slope stability (drained strength, undrained strength, residual strength), principles of slope stability analysis and applications to natural and man-made slopes, available instrumentation to monitor slope stability, and methods to mitigate or increase the factor of safety of marg inal slopes.
Also offered for graduate-levelcredit as CE547 and may be be taken only once for credit. Prerequis ite: CE 341.

## CE 448 - Geotechnical Case Studies (4)

Provides exposure to many different aspects of geotechnical engineering practice through a wide range of project case studies presented by local, practicing geotechnical engineers. The case studies will illu strate how to identify importantsite parameters within the site data and how these parameters might affect the project design.
Also offered for graduate-level credit as CE548 and may be taken only once for credit. Prerequis ite: CE 341.

## CE 450 - Transportation Safety Analysis (4)

Incorporating safety in highway engineering and trans portation planning that includes highway design, operation, and maintenance, as well as human factors, statistical analysis, traffic control and public policy. Design concepts of intersections, interchanges, signals, signs and pavement markings; analyzing data sets for recommendations and prioritization; principles of driver and vehicle characteristics in relation to the roadway.

Also offered for graduate-level credit as CE550 and may be taken only once for credit. . Prerequisite: CE351.

## CE 454 - Urban Transportation Systems (4)

Urban street patterns and transportation demand, highway capacity analysis, process of urban transport planning,
travel-demand forecasting and its application to traffic studies. Development of transport models, multiple regression analysis, models of land use and trip generations, stochastic trip dis tribution models, applications and case studies. Route assignment analysis and traffic flow theory.
Prerequisite: CE351.

## CE 458 - Public Trans portation Systems (4)

Performance characteristics of public transportation systems, with emphasis on urban systems. Planning, design, and operational issues related to public transportation systems. Emerging technologies. Expected preparation: CE 454.
Also offered for graduate-level credit as CE558 and may be taken only onceforcredit. .Prerequisite: CE351.

## CE 459 - Transportation Operations (4)

Operation, modeling, and control of unscheduled and scheduled transportation modes; elementary traffic flow concepts; flow, density and speed; scheduling; route and bottleneck capacities; networks; datainterpretation; analys is techniques; diagrams; simulation queuing; optimization. Expected preparation: CE 454.
Also offered for graduate-level credit as CE559 and may be taken only onceforcredit. .Prerequisite: CE351.
CE 462 - Traffic Engineering Applications and Signal Timing (4)
Theory and practice of traffic signal timing. Focuses on terms as sociated with signal timing, relating practice in the field with analysis completed using the Highway Capacity Manual and other traffic engineering software. A significant portion of the class is focused on applications, specifically focused on multimodal applications.

Also offered for graduate-level credit as CE562 and may be taken only onceforcredit. .Prerequisite: CE351.

## CE 469 - Subs urface Hydrology (4)

Basic principles of aqueous flow in the subsurface, emphasizing the importance of groundwater as a resource. Hydrologic cycle, his tory of groundwater usage, aquifer classification and properties, Darcy's experiments and Law, hydraulic head and potential, porosity and permeability, trans mis sivity and storativity, heterogeneity and anis otropy, saturated vs. unsaturated subsurface flow, and hydraulics of pumping wells (drawdown, flow in confined and unconfined aquifers, steady-state vs. transient flow, slug tests, and aquifer-test design).
Also offered for graduate-level credit as CE569 and may be taken only once for credit. . Prerequisite: Senior standing.

## CE 474 - Unit Operations of Environmental Engineering (4)

Unit operations of water and wastewater treatment; pretreatment; sedimentation, filtration, aeration, disinfection, sludge treatment and disposal, adv anced waste-water treatment processes.

Also offered for graduate-levelcredit as CE574 and may be taken only once for credit. . Prerequisite: CE371 or CE 487 or CH 223.

## CE 479 - Fate and Transport of Toxics in the Environment (4)

Chemical, physical, and biological principles that govern the behavior of toxic materials such as heavy metals and synthetic organic compounds in the environment. Course emphasizes practical ways to represent chemical processes in models of pollutant behavior. Topics include: adsorption of pollutants on soils and sediments; transport across sediment-water and air-water interfaces; bioamplification of pollutants; multiphase fugacity models of organics; case studies of contaminated surface water, sediment and groundwater. This course is the same as ESM 479 and may be taken only once for credit.
Also offered for graduate-level credit as CE579 and may be taken only once for credit. . Prerequisite: Senior standing. Cross-Listed as: ESM 479.

## CE 480 - Chemistry of Environmental Toxins (4)

The fate and transport-related behavior of toxic compounds in the environment. Classification, nomenclature, examples of anthropogenic compounds, and case studies. Introducing the physical and chemical processes associated with airwater exchange, organic-liquid exchange, sorption processes, chemical transformations, and bioaccumulation. Expected preparation: Ch 222.
Also offered for graduate-level credit as CE580 and may be taken only once for credit. . Prerequisite: Ch 221.

## CE 481 - The Columbia River as a System(2)

Explores the climate and hydrologic processes that shape the Columbia River basin ecosystem, and relates these processes to the basin's management context. The geographic scope includes the watershed, the mainstem and its reservoirs, major tributaries, the tidal river below Bonneville Dam, the es tuary, the Columbia plume, and coastal waters that interact with the plume. Lectures and outside speakers will presentor discuss vital is sues in contemporary Columbia Bas in management, along with relevant background information. Expected preparation: CE 361 and CE 371.
Also offered for graduate-levelcredit as CE581 and may be taken only once for credit. . Prerequisite: Junior standing.

## CE 482 - Introduction to Sediment Transport (4)

Fundamentals of sediment transport in natural surface waters. Analysis of the governing equations of mass, momentum, and sediment conservation. Covers bedload and suspended material transport in riverine and estuarine waters, focusing on non-cohesive materials. Cohesive material trans port will be briefly introduced.

Also offered for graduate-level credit as CE582 and may be taken only once forcredit. . Prerequisite: CE361 and CE 371.

## CE 483 - Estuarine Circulation (4)

Introduction to the physical processes that govern estuarine and buoyant plume circulation. These include tides, density-driven circulation, internal tidal asymmetry and frontal propagation. Expected preparation: CE 576.

Also offered for graduate-level credit as CE583 and may be taken only once forcredit. .Prerequisite: CE361 and CE 371.

## CE 484-Civil \& Environmental Engineering Project Management and Design I(3)

Engineering design process including owner design, profes sional-constructor relationships, procurement procedures, project evolution; contracts, dis pute res olution, bonds, warranties; construction documents, including specifications; cost estimating, planning, and scheduling; construction administration; group process, diversity, and leadership. Two lectures, one 3-hour design project laboratory period. CBL course.

Prerequisite: CEstudents: Completion of, at minimum, two of the following courses: CE 364, CE 450 (or CE 458, or CE 459, or CE 462, or CE 493), CE 432 (or CE 434), CE 444; ENVE students: Completion of, at minimum, two of the following: CE 474, CE 345, CE 364. Corequisite: CE 484L.

## CE 484L - Civil Engineering Project Management and DesignILab (0)

Lab for CE 484 Civil Engineering Project Management and Design I.
Corequisite: CE484.

## CE 485 - Environmental Cleanup and Restoration (4)

Survey of procedures for evaluating risks posed by hazardous waste sites and the cleanup steps that lead to an acceptable restoration of such sites. Topics include U.S. environmental law and regulation, site investigations, risk assessment, and a focus on actual case studies, many in Portland and the Pacific Northwest.
Also offered for graduate-level credit as CE585 and may be taken only once forcredit. . Prerequisite: Junior standing.

## CE 486 - Environmental Chemistry (4)

Survey of chemical aspects of major environmental is sues: stratospheric ozone holes and chlorofluorocarbons; air pollution; global climate change; fossil fuel energy/"carbon footprint"; renewable energy; nuclear energy/radioactivity; toxic chemicals (pesticides, PCBs); endocrine disruptors; surfactants, chemical dis persants/oil spills; biodegradability of chemicals; chemistry of natural waters/acid rain; toxic heavy metals. This is the same course as Ch 486 and can be taken only once forcredit.
Also offered for graduate-level credit as CE586 and may be taken only oncefor credit. Prerequisite: CE 371, or Ch 334 or Ch 331 with a grade of "C-" or higher. Cross-Listed as: Ch 486.

## CE 487 - Aquatic Chemistry (4)

Aqueous chemis try in natural water systems: simple-tocomplex acid/base chemis try; titration curves; buffer strength; acid/base chemistry of carbon dioxide in open and closed systems; alkalinity as systemvariable (blood); mineral dis solution/precipitation (metal carbonates); redox chemistry: pe-pH, redoxsuccession/organic
loading/dissolved oxygen loss, nitrate reduction, iron oxide dissolution, hydrogen sulfide production, methane formation. This is the same course as Ch 487 and can be taken oly once forcredit
Also offered for graduate-level credit as CE587 and may be taken only once for credit. .Prerequisite: CE371 or Ch 223 with a "C-" or better. Cross-Listed as: Ch 487.

## CE 488 - Air Quality (4)

An overview of urban air quality is sues facing cities in the US and globally. Examine effects of air pollution on public health and environment, as well as technologies and regulatory practices. Review pollution measurementand modeling techniques. Expected preparation: CE371.
Also offered for graduate-level credit as CE588 and may be taken only once for credit. Prerequis ite: Junior standing. Cross-Listed as: ESM 460.

## CE 489 - Introduction to Advanced Environmental Fluid Mechanics (4)

Advanced introduction to the geophysical fluid flows, including properties of seawater; conservation of mass, energy and momentum; dimensional analysis; the NavierStokes, Reynolds andturbulent kinetic energy equations; geostrophy and potential vorticity; long and short waves; and turbulence and boundary layers. Lecture and laboratory.
Also offered for graduate-level credit as CE589 and may be taken only once for credit. . Prerequisite: EAS 215, Mth 256, CE 361, CE 362. Corequisite: CE 489L.

## CE 489L - Lab for CE 489 (0)

Lab for CE 489.
Corequisite: CE489.

## CE 490 - Soil and Groundwater Restoration (4)

Methods for restoring contaminated soil and groundwater; Factors and processes influencing the efficacy of remediation systems. Emphasis on the scientific principles upon which soil and groundwater remediation is based. Containment, pump and treat, cosolvents and surfactants, soil venting, in-situ physical and chemical treatment.

Also offered for graduate-level credit as CE590 and may be taken only once for credit. . Prerequisite: Senior standing.

## CE 493 - Design and Operation of Bicycle and Pedestrian Infrastructure (4)

Design and operational concepts in the engineering design of bicycle and pedestrian infras tructure. Course covers onroad and shared path locations. Specific topics include design details of bikeways, basic geometric design, intersection and signalization considerations, and ADA requirements supporting non-motorized modes.
Also offered for graduate credit as CE593 and may be taken only once for credit. . Prerequisite: CE351 with a grade of C- or higher.

## CE 494-Civil \& Environmental Engineering Project Management and Design II (3)

Synthesis of civilengineering specialties in a diverse multi-disciplinary project. Teamwork approach in design of components and systems to meet stated objectives. Consideration of alternative solutions, methods, and products including constraints such as economic factors, safety, reliability, and ethics. Preparation of design documents, including: memoranda, computations, drawings, costestimates, specifications, bidding materials; written and oral presentations. Two lectures, one 3-hour design project laboratory period. CBL course.

Prerequisite: CE484. Corequisite: CE 494L.

## CE 494L - Civil Engineering Project Management and

 Design II Lab (0)Lab for CE 494 Civil Engineering Project Management and Design II.

Corequisite: CE494.

## CE 495 - Sustainable Transportation in the

 Netherlands (5)Introduction to transportation en gineering and planning applications in the Netherlands, focusing on pedestrian, bicycle and public transport. Contrasts between U.S. and Dutch engineering principles, policies and standards.

Design principles and practice will be explored through field trips and guest lectures while abroad and in Portland. Faculty led study abroad course.
Also offered for graduate-level credit as CE595 and may be taken only oncefor credit. . Prerequisite: Minimum GPA 3.0, senior status or graduate level fromall disciplines and majors.

## CE 497 - Transportation \& Health (4)

Introduction to the linkages between transportation investments, public policy, and behaviors and various related public and individualhealth outcomes. Content is divided into four modules covering: a) healthy behaviors, b) exposure to unsafe conditions, c) dis aster relief/emergency response and d) integration into practice/health impact analyses.

Prerequisite: CE351.
CE 501 - Research (1-9)
(Credit to be arranged.) Consent of instructor.

## CE 503 - Thesis (1-9)

(Credit to be arranged.) Consent of instructor.

## CE 504 - Cooperative Education/internship(1-9)

(Credit to be arranged.) Consent of ins tructor.

## CE 505 - Reading and Conference (1-6)

(Credit to be arranged.) Consent of instructor.

## CE 506 - Special Projects (1-9)

(Credit to be arranged.) Consent of instructor.

CE 507 - Seminar (1-6)
(Credit to be arranged.) Consent of instructor.

## CE 510 - Selected Topics (0-6)

(Credit to be arranged.) Consent of instructor.

## CE 511 - Law \& Civil/Environmental Engineering (4)

Overview of legal is sues relevant to civil and environmentalengineers, including contract law, environmental law, profes sional liability/negligence, and property law. This course willconsider legal decisions,
statutes and administrative rules, and case studies relevant to the practice of civil and environmental engineering.

Also offered for undergraduate-levelcredit as CE411 and may be taken only once for credit. Prerequisite: Graduatestanding.

## CE 512 - Sustainability in Civil \& Environmental Engineering Seminar (1)

This course features seminar speakers discussing sustainable practices in the broad discipline of engineering, and optimal collaborations in pursuit of that goal. Examples topics include green building design for zero net energy, urban heat management and minimization, "green vs. "gray" in was te water treatment, and feasibility of energy frombiomass.
Also offered for undergraduate-levelcredit as CE412. Prerequisite: CE362 or CE 341 orCE 464 or CE 325.

## CE 514 - Transportation Seminar (1)

This weekly seminar features a different speaker each week covering various topics in transportation research and practice. The topics cover all modes of transportation, with a focus on current practice. This course may be taken for credit up to three times.
Also offered for undergraduate-level credit as CE414. Cross-Listed as: This is the same course as USP 514.

## CE 516 - Forensic Structural Engineering (2)

Application of engineering principles to investigate failures and performance problems of structures; case studies andexamples of actual structural failures.
Also offered for undergraduate-levelcredit as CE416 and may be taken only once for credit. Prerequisite: CE 434 and CE 432 and CE 437.

## CE 517 - Timber Design (4)

Design of solid and glued-laminated beams, columns and arches; shear walls and diaphragms; connections; design provisions for wind and seismic forces.

Also offered for undergraduate-level credit as CE417 and may be taken only once for credit. . Prerequis ite: CE 325.

## CE 518 - Prestressed Concrete Design (4)

Analysis and design of components of prestressed concrete structures with reference to current codes.

Also offered as CE 618 and may be taken only once for credit. . Prerequisite: CE434 for undergraduates, or graduate standing.

## CE 519 - Bridge Engineering (4)

Introduction to analysis and design of short to medium span highway bridges, including load descriptions, analysis
and design procedures outlined in AASHTO Load Resistance Factor Design specifications.

Also offered for undergraduate-level credit as CE419 and may be taken only once for credit. . Prerequisite: CE 325.

## CE 521 - Theoretical and Computational Soil Mechanics (4)

Presents a theoretical framework for soil properties and soil behavior. Topics includeCauchy stress tensors, Hooke's elastic theory, plas ticity theory, Mohr-Coulomb soil model, and modified Cam clay elasto-plastic soil model. Part of the course uses computer simulations of geotechnical laboratory tests with FLAC software to apply geomechanical theory.
Also offered for undergraduate-level credit as CE421 and may be taken only once for credit. Prerequisite: Graduate standing.

## CE 523 - Vibration Analysis in Structural Engineering (4)

Fundamentals of vibration theory; applications in structural engineering. Free, forced, and transient vibration of single and multi-degrees of freedom systems including damping, normal modes, coupling, and normal coordinates.
Also offered for undergraduate-level credit as CE423 and may be taken only once for credit. . Prerequisite: EAS 212 and Mth 261.

## CE 524 - Matrix and Computer Methods in Structural Analysis (4)

Fundamental concepts of analysis for statically determinate and indeterminate structures utilizing matrices and computers; displacement and force methods applied to trusses and rigid frames; techniques for the analysis of large complex structures forstatic and dy namic loads. This is the first course in a sequence of two: CE 524 and CE 525.

Also offered as CE 624 and may be taken only once for credit. . Prerequisite: CE325.

## CE 526 - Theory of Plates (4)

Small and large deformation theories of thin plates; numerical and energy methods; free vibrations.

Also offered as CE 626 and may be taken only once for credit. . Prerequisite: Mth 256.

## CE 529 - Structural Dynamics (4)

Determination of normal modes and frequencies for structural systems. Transient and steady state response. Derivation and solution of governing equations using matrix formulation. Analysis of linear res ponse of structures to dynamic loadings. Stresses and deflections in structures.

Also offered as CE 629 and may be taken only once for credit. . Prerequisite: CE423/523.

## CE 531 - Stability of Structures (4)

Study of elastic and inelastic flexural buckling of bars and frames; use of energy methods and successive approximations; bracing of columns and frames; torsional, lateral-torsional, and local buckling.

Also offered for undergraduate-levelcredit as CE431 and may be taken only once for credit. . Prerequisite: CE 432/532, Mth 261 or equivalent.

## CE 532 - Structural Steel Design (4)

Design of components of steel structures based on allowable strength design and load and resistance factor design methods.
Also offered for undergraduate-level credit as CE432 and may be taken only once for credit.

## CE 533 - Cold-Formed Steel Design (4)

Design of cold-formed steel beams, columns, beamcolumns, cylindrical tubular members, and connections based on the Allowable Stress Design (ASD) and the Load and Resistance Factor Design (LRFD) methods of the AISI specification.
Also offered for undergraduate-levelcredit as CE433 and may be taken only once for credit. . Prerequisite: CE 432/532.

## CE 534 - Advanced Reinforced Concrete Design (3)

Design of spandrelbeams, slabs on beams, shear walls, deep beams, corbels, and other components of reinforced concretestructures with reference to current codes.
Also offered as CE 634 and may be taken only once for credit. . Prerequisite: CE435.

## CE 535 - Design of Reinforced Concrete Structures (4)

Development and splicing of reinforcement; design of long columns, retaining walls, footings, and slabs with reference to current codes; lateral loads; laboratory demonstration of beam and column behavior.

Also offered for undergraduate-levelcredit as CE435 and may be taken only once for credit. . Prerequis ite: CE 434.

## CE 536 - Masonry Design (3)

Materials of construction; design of masonry elements, lateral load res isting systems, and connections with reference to current codes.

Also offered for undergraduate-level credit as CE436 and may be taken only once for credit. . Prerequisite: CE 434.

## CE 537 - Earthquake Engineering (4)

Response of structures to ground motions; determination and use of response spectra; seismic design criteria and provisions forbuildings and otherstructures; and review of current practices for earthquake resis tant design.
Also offered as CE 637 and may be taken only once for credit. Prerequisite: CE 529/629.

CE 538 - Design of Composite Structures (4)
Design of composite steel-concrete members based on allowable stress design and load and resistance factor design methods.
Also offered for undergraduate-level credit as CE438 and may be taken only once for credit. . Prerequisite: CE 432/532.

## CE 539 - Advanced Steel Design (4)

Analysis and design of metal structures including connections, plate girders, design loads, structural systems, and bracing.

Also offered as CE 639 and may be taken only oncefor credit. Prerequisite: CE 432 or CE 532.

## CE 540 - Geos ynthetics in Infras tructure Engineering (2)

Testing and design with polymer-based geosynthetic products in and on soil for the civil infrastructure. Strength-based design applications are introduced with design-by-function principles, and product approval for trans portation, structural, and geotechnical disciplines. Use of geotextiles, geogrids, and geo-composites in slopes, mechanically stabilized earth retaining walls, pavement subgrades, and overlays.
Also offered for undergraduate-level credit as CE440 and may be taken only once for credit. . Prerequisite: CE 444.

## CE 541 - Advanced Soil Mechanics (4)

Study of the advanced principles of soil behavior related to stres s-strain, shear strength, permeability, and consolidation.

Also offered as CE 641 and may be taken only oncefor credit. Prerequisite: CE 341 or graduate standing. .

## CE 542 - In Situ Behavior and Testing of Soils (4)

Introduction to field behavior of soils related to engineering properties; site investigation procedures and in situ testing. Development of fundamentalanalytical solution techniques for engineering with soil, the use and limitations of elasticity as sumptions. Three lectures, one 3hour laboratory period.
Also offered for undergraduate-level credit as CE442 and may be taken only once for credit. . Prerequisite: CE 341.

## CE 543 - Introduction To Geotechnical Earthquake Engineering (4)

Introduces basics of geotechnical earthquake engineering. Topics include earthquake characteristics, attenuation relationships, fundamentals of soil liquefaction, semiempirical procedures for liquefaction triggering assessment for cohesionless soils, consequences of liquefaction, cyclic softening of cohesive soils, liquefaction mitigation techniques, and currentresearch on liquefaction modeling.
Also offered for undergraduate-level credit as CE443 and may be taken only once for credit. . Prerequisite: Graduate standing.

## CE 544 - Advanced Shallow Foundation Design (4)

Advanced topics in settlement and bearing capacity analys is of shallow foundation; application of nu merical schemes to foundation design.

Also offered as CE 644 and may be taken only once for credit. Prerequisite: CE 444.

## CE 545-Geo-environmental Engineering with Geosynthetics (2)

Application of polymer-based geosynthetic products for geo-environmental and municipal engineering including landfills, soil erosion control, filters, and drains. Testing, design, and productselection for hydraulic, degradation, and chemical stability properties. Introduction to reliability, endurance, and design life with reference to RCRA, ESA, and EPA laws.
Also offered for undergraduate-level credit as CE445 and may be taken only once for credit. . Prerequisite: CE 341.

## CE 546-Numerical Methods in Soil-Structure Interaction (4)

Application of finite difference and finite element methods to the solution of soil-structure problems, stability of soil masses and foundation installation. Useof commercial computer programs in working applied problems.
Also offered as CE 646 and may be taken only once for credit. Prerequisite: CE 444.

## CE 547 - Slope Stability Analysis (4)

Covers soil strength as it relates to slope stability (drained strength, undrained strength, res idual strength), principles of slope stability analysis and applications to natural and man-made slopes, available ins strumentation to monitor slope stability, and methods to mitigate or increase the factor of safety of marginal slopes.
Also offered for undergraduate-levelcredit as CE447 and may be taken only once forcredit. Prerequisite: Graduate standing.

## CE 548 - Geotechnical Case Studies (4)

Provides exposure to many different aspects of geotechnicalengineering practice through a wide range of project casestudies presented by local, practicing geotechnicalengineers. The case studies will illustrate how to identify importantsite parameters within the site data and how these parameters might affect the project design.
Also offered for undergraduate-level credit as CE448 and may be taken only once for credit. Prerequisite: Graduate standing.

## CE 549 - Deep Foundation Design and Analysis (4)

Comprehensive study of both driven and augered pile foundations, including concrete, steel, and timber. In-depth review of design methods for axial and lateral capacity. Special emphas is on the differences between driven piles and drilled shafts, including the role of full-scale load testing in the semi-empirical methods. Introduction to group theory in elasticity and plasticity.
Also offered as CE 649 and may be taken only once for credit. . Prerequisite: CE444.

## CE 550 - Transportation Safety Analysis (4)

Incorporating safety in high way engineering and transportation planning that includes highway design, operation, and maintenance, as well as human factors, statistical analysis, traffic control and public policy. Design concepts of intersections, interchanges, signals, signs and pavement markings; analyzing data sets for recommendations and prioritization; principles of driver and vehicle characteristics in relation to the roadway.
Also offered for undergraduate-level credit as CE450 and may be taken only once for credit. . Prerequisite: CE 351 .

## CE 553 - Freight Transportation and Logistics (4)

Study of freight transportation and logistics systems and their modeling, planning, design and operation. Focus on urban freight and city logistics and their connections to planning, land use, and urban design. Discussion and analys is of the impacts of freight and logistics on the transportation systemand the economy, equity, emis sions, and sustainability. Roles of public and private actors in freight/logistics systems.
Prerequisite: Graduate standing.
CE 554 - Introduction to Multimodal Transportation Engineering Data Analysis (4)

An introduction to multimodaltran sportation engineering data sets through applied analysis and visualization techniques. Includes an overview of datatypes, techniques for graphical analysis of data, and exposure to common software and statistical tools and vis ualizations in transportation engineering.

Prerequisite: graduate admis sion in Civil and EnvironmentalEngineering.

## CE 558 - Public Trans portation Systems (4)

Performance characteristics of public transportation systems, with emphasis on urban systems. Planning, design, and operationalissues related to public transportation systems. Emerging technologies.

Also offered for undergraduate-levelcredit as CE458 and may be taken only once for credit. . Prerequisite: CE 351. CE 454 recommended.

## CE 559 - Transportation Operations (4)

Operation, modeling, and control of unscheduled and scheduled transportation modes; elementary traffic flow concepts; flow, density and speed; scheduling; route and bottleneck capacities; networks; datainterpretation; analys is techniques; diagrams; simulation queuing; optimization.
Also offered for undergraduate-level credit as CE459 and may be taken only once for credit. . Prerequisite: CE 351. CE 454 recommended.

## CE 561 - Water Resource Systems Analysis (4)

A development of quantitative techniques used in the analys is of water res ources ystems for planning, design and operation. Emphas is is placed on thephysical, legaland economic as pects and their incorporation into simulation models. Applications include reservoirs ystems for water supply and hydropower, irrigation planning and operation, and water quality management.

Also offered as CE 661 and may be taken only once for credit.

## CE 562 - Traffic Engineering Applications and Signal Timing (4)

Theory and practice of traffic signal timing. Focuses on terms as sociated with signal timing, relating practice in the field with analysis completed using the Highway Capacity Manual and other traffic engineering software. A significant portion of the class is focused on applications, specifically focused on multimodal applications.
Also offered for undergraduate-levelcredit as CE462 and may be taken only once for credit. . Prerequisite: CE 351.

## CE 563 - Transportation and Logistics Optimization and Modeling (4)

Introduces students to mathematical modeling techniques including linear and non-linear programming, duality, Lagrangian, quadratic and geometric models, integer programming, basic network models and their application to trans portation and logistics systems/problems. The focus is on model formulation, complexity analysis, and the utilization of software to obtain solutions and analyze systemproperties. The concepts taught in this course focus
on civil engineering systems/applications with an emphas is on transportation and logistics problems.

Prerequis ite: Graduate standing.
CE 565 - WatershedHydrology (4)
Study of the movement and storage of water in watersheds, emphasizing physical processes. Includes systems analysis of watersheds, precipitation, s nowmelt, infiltration, evapotranspiration, ground-water flow, streamflow generation, open channelflow, hydrograph analysis, and an introduction to watershed hydrological modeling.

Prerequisite: Mth 252, Ph 201, Stat 244; recommended: ESR 320 and/or an undergraduate course. Cross-Listed as: This is the same course as ESM 525 and may be taken only once for credit.

## CE 566 - Environmental Data Analysis (4)

Application of probabilistic and statistical models to the description of environmental data with a focus on hydrology and water quality. Graphical and quantitative techniques of exploratory data analysis, selection and fitting of appropriate probability dis tributions, simple and multiple and multivariate regression and their applications to analys is and modeling, and detection of changes and trends in environmental time series. This is the same course as ESM 566 and may be taken only once for credit.
Also offered as CE 666 and may be taken only once for credit. . Prerequisite: graduate standing and Stat 243 and 244 or Stat 460. Cross-Listed as: ESM 566.

## CE 568 - Advanced Methods in Hydrologic Sys tem Analysis (4)

Principles in analys is of dynamic systems with specific emphas is onhydrologic model building. Variety of techniques in hydrologic systemanalysis with mathematical formulation, development and useof computer-based models for solving scientific and engineering problems are discussed. Among the topics presented will be the discussion of optimization theory, artificial intelligence, model calibration (parameter estimation), ensemble (probabilistic) forecasting, data assimilation and uncertainty analysis. Recommended prerequis ites: CE 465/565 or similar course.
Also offered as CE 668 and may be taken only once for credit. .

## CE 569 - Subs urface Hydrology (4)

Basic principles of aqueous flow in the subsurface, emphasizing the importance of groundwater as a res ource. Hydrologic cycle, his tory of groundwater usage, aquifer classification and properties, Darcy's experiments and Law, hydraulic head and potential, porosity and permeability, trans mis sivity and storativity, heterogeneity and anis otropy, saturated vs. unsaturated subsurface flow, and hydraulics of pumping wells (drawdown, flow in
confined and unconfined aquifers, steady-state vs. transient flow, slug tests, and aquifer-test design).

Also offered for undergraduate-levelcredit as CE469 and may be taken only once for credit. .

## CE 571 - Subs urface Contaminant Transport (4)

Principles as sociated with the tran sport and fate of contaminants in subsurface systems. Complex, heterogeneous factors and processes (both physical and geochemical) influencing contaminant transport. Emphasis on the impact of these processes on contaminant fate across the multitude of scales in the subsurface. Case studies linking theory and measured/observed transport behavior.

Prerequisite: graduatestanding. Cross-Listed as: Also offered as CE 671 and may be taken only once for credit. .

## CE 572 - Environmental Fluid Mechanical Transport

 (4)Introduction to the basic physical processes which trans port pollutants in natural waters (rivers, lakes, reservoirs, estuaries); mathematicalformulations of heat and mass advective and diffusive transport; descriptions of molecular diffusion, turbulent diffusion, and dis persion. Use of predictive mathematical models as a basis for water and air quality management.

Also offered as CE 672 and may be taken only once for credit. . Prerequisite: CE361 and CE 371.

## CE 573 - Numerical Methods in Environmental and Water Res ources Engineering (4)

Introduction to the mathematical solution of partial differentialequations by finite difference and finite element techniques. Development of solution approaches to water quality and hydraulic problems in surface and groundwater systems. Analy sis of model sensitivities, calibration and verification.
Also offered as CE 673 and may be taken only once for credit. . Prerequisite: senior or graduate standing in civil or environmental engineering.

## CE 574 - Unit Operations of Environmental Engineering (4)

Unit operations of water and wastewater treatment; pretreatment; sedimentation, filtration, aeration, dis infection, sludge treatment and disposal, adv anced waste-water treatment processes.
Also offered for undergraduate-level credit as CE474 and may be taken only once for credit. . Prerequisite: Ch 223 or CE 371 or CE 487 or graduate standing.
CE 576 - Environmental Fluid Mechanics (4)
Introduction to the fundamentals of the fluid dynamics of natural surface waters by analysis of the governing
equations of mass, momentum, and heatconservation. Applications include turbulence modeling, finite depth water motions, stratified flow phenomena, and seiche phenomena.
Also offered as CE 676 and may be taken only oncefor credit. . Prerequisite: CE361, CE 362 and CE 371.

## CE 578 - Water Quality Modeling (4)

Introduction to descriptive modeling approaches for analyzing water quality changes in lakes, reservoirs, rivers, and estuaries. Applications include modeling dis solved oxygen, temperature, nutrients, and algal dy namics.

Also offered as CE 678 and may be taken only oncefor credit. . Prerequisite: EAS 361, CE 371.

## CE 579 - Fate and Transport of Toxics in the Environment (4)

Chemical, physical, and biological principles that govern the behavior of toxic materials such as heavy metals and synthetic organic compounds in the environment. Course emphasizes practical ways to represent chemical processes in models of pollutant behavior. Topics include: adsorption of pollutants on soils and sediments; transport across sediment-water and air-water interfaces; bioamplification of pollutants; multiphase fugacity models of organics; case studies of contaminated surface water, sediment and groundwater. This is the same course as ESM 579 and may be taken only once for credit.

Also offered for undergraduate-level credit as CE479 and may be taken only once for credit. Prerequisite: senior or graduate standing. Cross-Listed as: ESM 579.

## CE 580 - Chemistry of Environmental Toxins (4)

The fate and transport-related behavior of toxic compounds in the environment. Classification, nomenclature, examples of anthropogenic compounds, and case studies. Introducing the physical and chemical processes associated with airwater exchange, organic-liquid exchange, sorption processes, chemical transformations, and bioaccumulation.
Also offered for undergraduate-level credit as CE480 and may be taken only once for credit. . Prerequisite: Ch 221; Ch 222 recommended.

## CE 581 - The Columbia River as a System(2)

Explores the climate and hydrologic processes that shape the Columbia River basin ecosystem, and relates these processes to the basin's management context. The geographic scope includes the watershed, the mainstem and its reservoirs, major tributaries, the tidal river below Bonneville Dam, the estuary, the Columbia plume, and coastal waters that interact with the plume. Lectures and outside speakers will presentor discuss vital is sues in contemporary Columbia Bas in management, along with relevant background information. Expected preparation: CE 361 and CE 371.

Also offered for undergraduate-levelcredit as CE481 and may be taken only once for credit. . Prerequisite: junior standing.

## CE 582 - Introduction to Sediment Transport (4)

Fundamentals of sediment transport in natural surface waters. Analysis of the governing equations of mass, momentum, and sediment conservation. Covers bedload and suspended material transport in riverine and estuarine waters, focusing on non-cohesive materials. Cohesive material transport will be briefly introduced.

Also offered for undergraduate-levelcredit as CE482 and may be taken only once for credit. . Prerequisite: CE 361, CE 371.

## CE 583 - Estuarine Circulation (4)

Introduction to the physical processes that govern estuarine and buoyant plume circulation. These include tides, density-driven circulation, internal tidal as ymmetry and frontal propagation. Expected preparation: CE 576.
Also offered for undergraduate-levelcredit as CE483 and may be taken only once for credit. . Prerequis ite: CE 361 and CE 371.

## CE 585 - Environmental Cleanup and Restoration (4)

Survey of procedures for evaluating risks posed by hazardous wastesites and thecleanup steps that lead to an acceptable restoration of such sites. Topics include U.S. environmental law and regulation, site investigations, risk assessment, and a focus on actual case studies, many in Portland and the Pacific Northwest.
Also offered for undergraduate-level credit as CE485 and may be taken only once for credit. . Prerequisite: junior standing or graduate standing.

## CE 586 - Environmental Chemistry (4)

Survey of chemical aspects of major environmental is sues: stratospheric ozone holes and chlorofluorocarbons; air pollution; global climate change; fossil fuel energy/"carbon footprint"; renewable energy; nuclear energy/radioactivity; toxic chemicals (pesticides, PCBs); endocrine disruptors; surfactants, chemical dispersants/oil spills; biodegradability of chemicals; chemistry of natural waters/acid rain; toxic heavy metals. This is the same course as Ch 586 and can be taken only once for credit.
Also offered for undergraduate-levelcredit as CE486 and may be taken only once for credit. . Prerequisite: Ch 334 or 331. Cross-Listed as: Ch 586.

## CE 587 - Aquatic Chemistry (4)

Aqueous chemistry in natural water systems: simple-tocomplex acid/base chemistry; titration curves; buffer strength; acid/base chemistry of carbon dioxide in open and closed systems; alkalinity as system variable (blood); mineral dis solution/precipitation (metal carbonates); redox
chemistry: pe-pH, redoxsuccession/organic loading/dissolved oxygen loss, nitrate reduction, iron oxide dissolution, hydrogen sulfide production, methane formation. This is the same course as Ch 587 and can be taken oly once forcredit.
Also offered for undergraduate-level credit as CE487 and may be taken only once for credit. . Prerequisite: Ch 223 with a C- or better. Cross-Listed as: Ch 587.

## CE 588 - Air Quality (4)

An overview of urban air quality is sues facing cities in the US and globally. Examine effects of air pollution on public health and environment, as well as technologies and regulatory practices. Review pollution measurement and modeling techniques. Expected preparation: CE371.

Also offered for undergraduate-level credit as CE488 and may be taken only once for credit. Prerequisite: junior standing. Cross-Listed as: ESM 560.

## CE 589 - Introduction to Advanced Environmental Fluid Mechanics (4)

Advanced introduction to the geophysical fluid flows, including properties of seawater; conservation of mass, energy and momentum; dimensional analysis; the NavierStokes, Reynolds and turbulent kinetic energy equations; geostrophy and potential vorticity; long and short waves; and turbulence and boundary layers. Lecture and laboratory.
Also offered for undergraduate-level credit as CE489 and may be taken only once for credit. . Prerequisite: EAS 215, Mth 256, CE 361, CE 362. Corequisite: CE589L.
CE 589L - Lab for CE 589 (0)
Lab for CE 589.
Corequisite: CE589.

## CE 590 - Soil and Groundwater Restoration (4)

Methods for restoring contaminated soil and groundwater; Factors and processes influencing the efficacy of remediation systems. Emphas is on the scientific principles upon which soil and groundwater remediation is based. Containment, pump and treat, cosolvents and surfactants, soil venting, in-situ physical and chemical treatment.
Also offered for undergraduate-level credit as CE490 and may be taken only once for credit. . Prerequis ite: senior/grad standing.

## CE 593 - Design and Operation of Bicycle and Pedestrian Infrastructure (4)

Design and operational concepts in the engineering design of bicycle and pedestrian infras tructure. Course covers onroad and shared path locations. Specific topics include design details of bikeways, basic geometric design,
intersection and signalization considerations, and ADA requirements supporting non-motorized modes.

Also offered for undergraduate credit as CE493 and may be taken only oncefor credit.

## CE 595 - Sustainable Transportation in the Netherlands (5)

Introduction to transportation engineering and planning applications in the Netherlands, focusing on pedestrian, bicycle and public transport. Contrasts between U.S. and Dutch engineering principles, policies and standards. Design principles and practice will be explored through field trips and guest lectures while abroad and in Portland. Faculty led study abroad course.
Also offered for undergraduate-levelcredit as CE495 and may be taken only once for credit. Prerequisite: Minimum GPA 3.0, senior status or graduate level fromall disciplines and majors.
CE 596 - Theories \& Methods of Travel Behavior (4)
Covers the various theoretical pers pectives on travel behavior and the methodological approaches used to analyze and understand behavior. Travelbehavior includes the study of the set of transportation choices and outcomes, including: vehicle ownership, activity engagement and scheduling, mode choices, destination choices, and routing decisions.

Also offered as CE 696. Prerequisite: Graduate standing or consent of instructor.

## CE 597 - Transportation \& Health (4)

This course will introduce the linkages between trans portation investments, public policy, and behaviors and various related public and individual health outcomes. The content is divided intofour modules covering: a) healthy behaviors, b) exposure to unsafe conditions, c) dis aster relief/emergency res ponse and d) integration into practice/health impact analyses.
Also offered as undergraduate-level credit as CE497 and may be taken only once for credit. Prerequisite: CE 351 or graduate standing.

## CE 598 - Travel Survey Methods \& Analysis (4)

Focuses on the design, administration, and analysis of various types of surveys used to collect transportation data, including but not limited to household travel surveys, establishment surveys, interceptsurveys, and freight/commercial vehicle surveys.

Also offered as CE 698 and may be taken only once for credit. Prerequisite: CE 454 or graduate standing.

## CE 601 - Research (1-9)

(Credit to be arranged.) Consent of instructor.

## CE 603 - Dissertation (1-12)

(Credit to be arranged.) Consent of instructor.

## CE 604 - Cooperative Education/Internship (1-9)

(Credit to be arranged.) Consent of instructor.

## CE 605 - Reading and Conference (1-9)

(Credit to be arranged.) Consent of ins tructor.

CE 606 - Special Projects (1-9)
(Credit to be arranged.) Consent of instructor.

CE 607 - Seminar (1-9)
(Credit to be arranged.) Consent of instructor.

## CE 610 - Selected Topics (1-9)

(Credit to be arranged.) Consent of instructor.

## CE 618 - Prestressed Concrete Design (4)

Analysis and design of components of prestressed concrete structures with reference to current codes.

Also offered as CE 518 and may be taken only oncefor credit. . Prerequisite: CE434 for undergraduates, or graduate standing.
CE 624 - Matrix and Computer Methods in Structural Analysis (4)
Fundamental concepts of analysis for statically determinate and indeterminate structures utilizing matrices and computers; displacement and force methods applied to trusses and rigid frames; techniques for the analysis of large complex structures for static and dy namic loads. This is the first course in a sequence of two: CE 624 and CE 625.

Also offered as CE 524 and may be taken only once for credit. . Prerequisite: CE325.

## CE 626 - Theory of Plates (4)

Small and large deformation theories of thin plates; numerical and energy methods; free vibrations.
Also offered as CE 526 and may be taken only once for credit. . Prerequisite: Mth 256.

## CE 629 - Structural Dynamics (4)

Determination of normal modes and frequencies for structural systems. Transient and steady state response. Derivation and solution of governing equations using matrix formulation. Analysis of linear res ponse of structures to dynamic loadings. Stresses and deflections in structures.

Also offered as CE 529 and may be taken only once for credit. . Prerequisite: CE423/523.

## CE 634 - Advanced Reinforced Concrete Design (3)

Design of spandrelbeams, slabs on beams, shear walls, deep beams, corbels, and other components of reinforced concretestructures with reference to current codes.
Also offered as CE 534 and may be taken only once for credit. Prerequisite: CE 435.

## CE 637 - Earthquake Engineering (4)

Response of structures to ground motions; determination and use of response spectra; seismic design criteria and provisions for buildings and other structures; and review of current practices for earthquake resistant design.
Also offered as CE 537 and may be taken only oncefor credit. Prerequis ite: CE 529/629.

## CE 639 - Advanced Steel Design (4)

Analysis and design of metal structures including connections, plate girders, design loads, structural systems, and bracing.
Also offered as CE 539 and may be taken only once for credit. Prerequisite: CE 432 or CE 532.

## CE 641 - Advanced Soil Mechanics (4)

Study of the advanced principles of soil behavior related to stress-strain, shear strength, permeability, and cons olidation.
Also offered as CE 541 and may be taken only once for credit. Prerequisite: CE 444.

## CE 644 - Advanced Shallow Foundation Design (4)

Advanced topics in settlement and bearing capacity analys is of shallow foundation; application of numerical schemes to foundation design.
Also offered as CE 544 and may be taken only once for credit. Prerequisite: CE 444.

## CE 646 - Numerical Methods in Soil-Structure Interaction (4)

Application of finite difference and finite element methods to the solution of soil-structure problems, stability of soil masses and foundation installation. Useof commercial computer programs in working applied problems.

Also offered as CE 546 and may be taken only once for credit. Prerequisite: CE 444.

## CE 649 - Deep Foundation Design and Analysis (4)

Comprehensive study of both driven and augered pile foundations, including concrete, steel, and timber. In-depth review of design methods for axial and lateral capacity. Special emphas is on the differences between driven piles and drilled shafts, including the role of full-scale load testing in the semi-empirical methods. Introduction to group theory in elasticity and plasticity.
Also offered as CE 549 and may be taken only once for credit. . Prerequisite: CE444.

## CE 661 - Water Resource Systems Analysis (4)

A development of quantitative techniques used in the analys is of water resource systems for planning, design and operation. Emphas is is placed on the physical, legal and economic aspects and their incorporation into simulation models. Applications include reservoir systems for water supply and hydropower, irrigation planning and operation, and water quality management.
Also offered as CE 561 and may be taken only once for credit.

## CE 666 - Environmental Data Analysis (4)

Application of probabilistic and statistical models to the description of environmental data with a focus on hydrology and water quality. Graphical and quantitative techniques of exploratory data analysis, selection and fitting of appropriate probability dis tributions, simple and multiple and multivariate regression and their applications to analys is and modeling, and detection of changes and trends in environmental time series.

Also offered as CE 566 and may be taken only once for credit. . Prerequisite: graduatestanding and Stat 243 and 244 or Stat 460.

## CE 668 - Advanced Methods in Hydrologic System Analysis (4)

Principles in analys is of dynamic systems with specific emphas is onhydrologic model building. Variety of techniques in hydrologic systemanalysis with mathematical formulation, development and useof computer-based models for solving scientific and engineering problems are discussed. Among the topics presented will be the discussion of optimization theory, artificial intelligence, model calibration (parameter estimation), ensemble (probabilistic) forecasting, data as similation and uncertainty analy sis. Recommended prerequisites: CE 465/565 or similar course.
Also offered as CE 568 and may be taken only once for credit. .

## CE 671 - Subs urface Contaminant Transport (4)

Principles as sociated with the tran sport and fate of contaminants in subsurface systems. Complex, heterogeneous factors and processes (both physical and geochemical) influencing contaminant transport. Emphasis on the impact of these processes on contaminant fate across the multitude of scales in the subsurface. Case studies linking theory and measured/observed transport behavior.
Also offered as CE 571 and may be taken only oncefor credit. . Prerequisite: graduate standing.

## CE 672 - Environmental Fluid Mechanical Transport

 (4)Introduction to the basic physical processes which trans port pollutants in natural waters (rivers, lakes, reservoirs, estuaries); mathematical formulations of heat and mass advective and diffusive transport; descriptions of molecular diffusion, turbulent diffusion, and dis persion. Use of predictive mathematical models as a basis for water and airquality management.

Prerequisite: CE361 and CE 371. Cross-Listed as: Also offered as CE 572 and may be taken only once for credit. .

## CE 673 - Numerical Methods in Environmental and Water Res ources Engineering (4)

Introduction to the mathematical solution of partial differentialequations by finite difference and finite element techniques. Development of solution approaches to water quality and hydraulic problems in surface and groundwater systems. Analy sis of model sensitivities, calibration and verification.
Also offered as CE 573 and may be taken only oncefor credit. . Prerequisite: senior or graduate standing in civil or environmental engineering.

## CE 676 - Environmental Fluid Mechanics (4)

Introduction to the fundamentals of the fluid dynamics of natural surface waters by analysis of the governing equations of mass, momentum, and heat conservation. Applications include turbulence modeling, finite depth water motions, stratified flow phenomena, and seiche phenomena.
Also offered as CE 576 and may be taken only once for credit. . Prerequisite: CE361, CE 362 and CE 371.

## CE 678 - Water Quality Modeling (4)

Introduction to descriptive modeling approaches for analyzing water quality changes in lakes, reservoirs, rivers, and estuaries. Applications include modeling dissolved oxygen, temperature, nutrients, and algal dynamics.
Also offered as CE 578 and may be taken only once for credit. . Prerequisite: EAS 361, CE 371.

## CE 696 - Theories and Methods of Travel Behavior (4)

Covers the various theoretical pers pectives on travel behavior and the methodological approaches used to analyze and understand behavior. Travelbehavior includes the study of the set of transportation choices and outcomes, including: vehicle ownership, activity engagement and scheduling, mode choices, destination choices, and routing decisions.
Also offered as CE 596. Prerequisite: Graduate Standing.
CE 698 - Travel Survey Methods \& Analysis (4)
Focuses on the design, administration, and analysis of various types of surveys used to collect transportation data, including but not limited to household travel surveys, establishment surveys, intercept surveys, and freight/commercial vehicle surveys.

Also offered as CE 598, and can only betaken once for credit. Prerequisite: Graduate standing.

## CFS - Child \& Family Studies

## CFS 101 - Introduction to Child and Family Studies (2)

Overview of the field of child and family studies, reviewing its historic development and the advantages of an interdisciplinary approach to studying children, youth, and families. Students will survey services that support children, youth, and families. Students will explore professional opportunities, careers choices, and professional organizations.

## CFS 310 - Critical Histories in CYFS: Gender/Race/Class (4)

This course provides a space for critical reflection on the nature of power in professions serving children, youth, and families. Students will explore historical and contemporary patterns of feminization of these professions and the implications, including the social and economic devaluation of this work and institutions as gendered settings. Students will also critically consider the racialized his tory of this work and res is tance by communities served by these professions.

## CFS 312U-Families in Lifecourse Perspective (4)

This course offers a deeper understanding of family life and its intersection with individual developmentacross the lifespan. Life Course Theory will provide the foundation for understanding the dynamic experiences of families as we explore physical, social/emotional, and cognitive development frombirth to death. Students will have the opportunity to critically process developmental theories through lecture, discussion, videos, and assignments. There
will be a focus on is sues of diversity, anti-oppression, and social justice.

Prerequisite: junior standing.
CFS 318U- Black Families in the U.S. (4)
Overview of contemporary theories and research of the Black family in the U.S. Examination of the historical and socio-economic contexts surrounding families and the impacts on family structure and experiences. Topics for discussion include health issues, family formations, racism, community organizing, welfare and economic security.

Cross-Listed as: This is the same course as BSt 318U and may be taken only once forcredit.

## CFS 320U- ABCs of Early Childhood Education (4)

An introductory class for students preparing for parenthood or interested in careers in early childhood education. His tory and philosophy; observation processes; guidance approaches; and program as sessment.

## CFS 330U- American Families in Film and Television (4)

Examines portrayals of American families in film and television over time, including the effect of film and television portrayals on expectations around such family is sues as gender roles, conflict resolution, parenting, and traditions. Exposes students to film and media criticism and highlights issues of inclusion/exclusion in family portrayals.

## CFS 340U- Queer Families (4)

Explores and investigates is sues facing lesbian, gay, bisexual, and transgender (LGBT) families, including all relationships in which primary care-giving res ponsibilities are shared by individuals who are interdependent upon each other, including conjugal and non-conjug al relationships. We will consider LGBT families and their cultural, political, gender, racial, and economic dimensions.

## CFS 350U - Interpersonal Violence: Impact on Children \& Families (4)

Focuses on interpersonal violence (IPV) and its impacts on children, including developmental implications of witnessing IPV from birth to adulthood, and the behavioral, social, and emotional effects of exposure to violence. Prepares students to identify tactics of violence, assess children's exposure to IPV, and respond through prevention and early intervention.

## CFS 360 - Critical Disability: Impacts on Children, Youth, \& Families (4)

Focuses on the social, historical, and cultural constructions and contexts of dis ability in the US. Through the lens of critical dis ability studies, examines how power relationships and discourse function in the lives of people with and without disabilities, and the structures and policies that empower these dis courses. Emphasizes intersections of dis ability with other identities and positionalities (gender, sexuality, race, class, etc.). Impacts of dis ability dis courses and structures on children, youth, and families will be examined.

Prerequisite: Upper-division standing.

## CFS 381U - Families, Stress, and Change (4)

Overview of is sues related to family health, including health promotion/prevention domestic violence/child abuse, alcohol/chemical dependence, chronic and terminal illnesses, and accessing health systems. Special attention to ethnic, political, ideological, religious, economic, and geographic influences. Includes community-based learning components.
Prerequisite: junior standing.
CFS 382U- Mental Disorders: Issues for Families and Communities (4)

Explores the etiology of mental and emotional dis orders and the impact on individuals, their families and communities. The course emphasizes current social, cultural and political forces affecting individuals and families, and factors that contribute to resilience and recovery. The course includes a community-based learning component.
Prerequisite: junior standing.

## CFS 385U - Working with Diverse Families (4)

For individuals who are preparing to work professionally with families. Theoretical pers pectives on working with families. Is sues involved when working with diverse U.S. families (African American, Asian, Russian, and Hispanic) as well as international families.

## CFS 386U- Youth Healthy Relationships and Sexuality Education (4)

Explores the demands, parameters and possibilities of healthy relationship and sexuality education (HRSE) for youth. Together we will wrestle with what has come before and imagine what could be, focusing on the strengths and voices of people who are currently and historically pushed to the margins, and exploring what youth tell us they want and need. Through active participation, students can gain 'best practices' foundational skills and understanding of equitable methods for facilitating group HRSElessons.

## CFS 388 -Sexual and Reproductive Justice in the United States (4)

SRJ is based on theorizing of Black Feminists, and res istance of women of color, youth, trans, and queer activists. We explore how movements for reproductive rights, sexual liberation, racial, gender and economic justice intersect; historical and current backlash to this organizing; and demands for social and cultural change from the most impacted communities. Topics covered include: abortion and contraception use in the U.S.; sexual and reproductive oppression; birthing justice; the rightto parent; criminalization of bodies; and bodily autonomy in relation to the state and community.

## CFS 390U - Sex and the Family (4)

Explores how responses to sexuality are influenced by family and other social systems including culture, gender, economics, and religion. Family systems theory will be used to evaluate family relationships.
Prerequisite: junior standing.
CES 391 -Family Theories (4)
Theoretical and conceptual foundations of working with children, youth, and families in professional settings. Historical, socio- political contexts of significant theories and their relevance for professional application.

## CFS 393U - Community Resources and Family Support

 (4)Examination of community res ources in the context of community building, family support and empowerment, cultural competence, and cultural democracy. Factors that influence the effectiveness of community programs serving children and families. The mission, professional roles, and services of particular community agencies and programs that serve, support, and/or advocate on behalf of children and families.
Prerequisite: junior standing.
CFS 399 -Special Studies (1-4)
(Credit to be arranged.)

CFS 399U-Special Studies (4)
(Credit to be arranged.)

## CFS 401 - Research (1-8)

(Credit to be arranged.)

CFS 402 - Independent Study (1-12)
(Credit to be arranged.)

CFS 404 -Cooperative Education/Internship (1-12)
(Credit to be arranged.)

## CFS 405 - Reading and Conference (1-8)

(Credit to be arranged.)

## CFS 406 -Projects (1-8)

(Credit to be arranged.)

CFS 407 -Seminar (1-12)
(Credit to be arranged.)

## CFS 408-Workshop(1-4)

(Credit to be arranged.)

## CFS 409 - Practicum(0-12)

(Credit to be arranged.) Supervised community-based learning experience in org anizations and agencies that serve children and families. One credit equals 30 hours. Includes reflective, integrative seminar.
Prerequisite: CFS 494.

## CFS 410 -SelectedTopics (1-8)

(Credit to be arranged.)

## CFS 440 - Critical Youth Studies (4)

Drawing on fields including history, sociology, education, literature, religion, politics, psychology, economics, cultural studies, and more, Youth Studies examines the development, history, and meaning of youth as a social construct. Critical Youth Studies adds to this analysis the consideration of power as it shapes the construction and experience of youth. Post-structuralism, discourse, the sociological imagination, critical race theory, queer theory, and critical feminis ms ground this analysis. Practical implications for education and human services are explored.
Prerequisite: Upper-division standing.

## CFS 450 - Youth Work Practice (4)

Explores youth work principles, multiple youth work traditions, experiential/outdoor education, and other dimensions of youth work. Focuses on development of youth work skills for application in settings including education, corrections, social and human services, res idential care, and more. Intended for students planning careers in education, policy, and direct service with youth. Graduate students will participate in one hour of additional class time per week, to be scheduled with the instructor at the first class session.

Prerequisite: Junior standing.

## CFS 486 - Parent and Family Education (4)

Introduction to parenting rights, responsibilities, practices, processes, parent/child relationships, changing parenting roles and general philosophy/broad principles of family life education. Planning, observing, and evaluating family life education programs will be included through a community based experience. Recommended prerequisite: junior status.

Also offered for graduate-level credit as CFS 586 and may be taken only once for credit.

## CFS 487 - Examining Bias and Belief (4)

Individuals preparing for human or social services profes sions have been influenced by family and societal events, values, beliefs, and assumptions which have interacted with their lives. Students will examine those influences (including gender, culture, and socioeconomic status) for the purpose of gaining insight into the ways their profes sional practice might be affected. Projects will include a profes sional practice action plan.

Prerequisite:upper-division standing.

## CFS 488 -Structural Oppression (4)

Examines and applies principles of anti-oppressive practice (AOP) in the helping professions served by students with degrees in Child and Family Studies. The course will present theoretical foundations for AOP grounded in discussions of power and privilege, voice, marginalization and oppression, and the role of the helping professional in working to transformoppressive social structures, values, and behaviors.
Prerequisite: CFS 487 and junior standing.

## CFS 489 - Activismfor Social Change (2)

This course prepares students for activismin profes sional settings serving children, youth, and families. Building on CFS 487 and CFS 488, students will study social change and activis $m$. They will research a social injustice, conceptualize and carry out a social change action, and reflect on les sons learned for their activism.

Prerequisite: CFS 488.

## CFS 492 - Family Law and Policy (4)

Laws and policies that influence the well-being of families, youth, and children will be examined from a historical, socio-political perspective. Analysis of contextual influences and community based learning experience will assiststudents in practical applications related to professional roles.

## CFS 493 - Professional Self: Ways of Knowing (2)

This course is the first in a series of four courses that introduces students to understanding interdis ciplinary perspectives and the ways in which pers onal development, professional identity, and professional action contribute to our developing professional self. This course will examine
"ways of knowing" and the construction of knowled ge in our interdisciplinary professional fields. Students will critically reflect on the "ways of knowing" and develop their research literacy. Emph as is will be placed on reflection, personal ethics, self-care, interdisciplinary career paths, and scholarly foundations.
Prerequisite: Admittance to Child \& Family Studies .

## CFS 494 - Professional Self: Critical Thinking (2)

Students will begin the process of documenting their achievement of the first CFS Learning Outcome as they establish the foundation of the CFS Profes sional Portfolio. The history and development of female-intensive professions, professionalization, ethical decision-making, and the creation and use of theoretical knowledge will also be a focus.

Prerequisite: Admittance into the Child and Family Studies Programand CFS 493.

## CFS 495 - Professional Self: Identity (2)

Continued examination of interdisciplinary pers pectives and the ways in which pers onal development, professional identity, and professional action contribute to professional development. Emphasis will be on reflective practice, professional ethics, professional boundaries, professionalization processes, legis lation, and advocacy.
Prerequisite: CFS 494.

## CFS 496 - Professional Self: Integration (2)

Students will complete their CFS Professional Portfolio as they document their achievement of the finalCFS Learning Outcomes. They will consider the relationship between person and professional ethical decisions, the role of change agents in society, and attend a professional organization meeting.
Prerequisite: CFS 495.

## CFS 497 - PracticumI (5)

Child and Family Studies practicumconducted in approved profes sional settings with consideration for students’ profes sional goals.
Prerequisite: junior standing, admittance to Child and Family Studies Program, grade of Corbetter in CFS 493.

## CFS 498 - Practicum II (5)

Child and Family Studies practicumconducted in approved profes sional settings selected with consideration of students? professional goals. Accompanying seminar.

Prerequisite: admittance into the CFS program, five credits of CFS 497, and CFS 487 (completion or concurrent registration).

## CFS 501 - Research (1-9)

(Credit to be arranged.)

## CFS 505 - Reading and Conference (1-6)

(Credit to be arranged.)

## CFS 510 -SelectedStudies (1-8)

(Credit to be arranged.)

## CFS 580 -Societal Influences on Professional Practice (4)

Individuals preparing for human or social services profes sions have been influenced by family and societal events, values, beliefs, and assumptions which have interacted with their lives. Students will examine those influences (including gender, culture, and socioeconomic status) for the purpose of gaining insight into the ways their profes sional practice might be affected. Projects will include a profes sional practice action plan.

## CFS 586 - Parent and Family Education (4)

Introduction to parenting rights, responsibilities, practices, processes, parent/child relationships, changing parenting roles and general philosophy/broad principles of family life education. Planning, observing, and evaluating family life education programs will be included through a community based experience. Recommended prerequisite: junior status.
Also offered for undergraduate-level credit as CFS 486 and may be taken only once for credit.

## Ch - Chemistry

Ch 104 - Introductory Chemistry I (4)
A survey of chemistry for students in nursing, in allied health fields such as dental hygiene, in forestry, and in the liberal arts. This course is not intended for science or engineering majors. This is the first course in a sequence of three: Ch 104, Ch 105 and Ch 106 which must be taken in sequence. Ch 104 - Ch 109 does not satisfy the first-year Chemistry requirement for most science and engineering majors.
Prerequisite: Two years of high school algebraor Mth 095.

## Ch 105 - Introductory Chemistry II (4)

A survey of chemistry for students in nursing, in allied health fields such as dental hygiene, in forestry, and in the liberal arts. This course is not intended forscience or engineering majors. This is the second course in a sequence of three: Ch 104, Ch 105 and Ch 106 which must be taken in sequence. Ch 104 - Ch 109 does not satisfy the first-year Chemistry requirement for most science and engineering majors.

## Ch 106 - Introductory Chemistry III (4)

A survey of chemistry for students in nursing, in allied health fields such as dental hygiene, in forestry, and in the liberal arts. This course is not intended forscience or engineering majors. This is the third course in a sequence of three: Ch 104, Ch 105 and Ch 106 which must be taken in sequence. Ch 104-Ch 109 does not satisfy the first-year Chemistry requirement for most science and engineering majors.

## Ch 107 - Introductory Chemistry Laboratory I (1)

Laboratory work to accompany Ch 104, 105, 106 respectively. Concurrent enrollment in the appropriate lecture course is required. Ch 107, 108; one 2-hour laboratory period. Pas s/no pass only. Ch 109: one 3-hour laboratory period. This is the first lab in a sequence of three: Ch 107, Ch 108. and Ch 109 wihich must be taken in sequence.

## Ch 108 - Introductory Chemistry Laboratory II (1)

Laboratory work to accompany Ch 104, 105, 106 respectively. Concurrent enrollment in the appropriate lecture course is required. Ch 107, 108; one 2-hour laboratory period. Pass/nopass only. Ch 109: one 3-hour laboratory period. This is the second lab in a sequence of three: Ch 107 , Ch 108. and Ch 109 wihich must be taken in sequence.

## Ch 109 - Introductory Chemistry Laboratory III (1)

Laboratory work to accompany Ch 104, 105, 106 res pectively. Concurrent enrollment in the appropriate lecture course is required. Ch 107, 108; one 2-hour laboratory period. Pass/nopass only. Ch 109: one 3-hour laboratory period. This is the third lab in a sequence of three: Ch 107 , Ch 108 . and Ch 109 wihich must be taken in sequence.

## Ch 121 - Preparatory Chemistry (4)

Introduction to mathematics and s cience presupposed by the General Chemistry sequence (Ch 221 , Ch 222, and Ch 223). Designed for students needing a review of topics from high school chemis try and Mth 111 . Successful completion of this course should leave students prepared for Ch 221.

Prerequisite: Mth 111 or equivalent.
Ch 170 - Fundamentals of Environmental Chemistry (4)

A course designed to increase the scientific knowledge of the non-science major. The interaction between science and society, the nature of matter and chemical reactions. Energy, radiation, and nuclear power.

## Ch 199 - Special Studies (1-9)

See department for course description. (Credit to be arranged.)

## Ch 199L - Lab for Ch 199 (0)

Lab for Ch 199.

## Ch 221 - General Chemistry I (4)

Fundamental basis of chemistry for science, engineering and health professional students (such as predental, premedical, premedicaltechnology and veterinary students). Concurrent enrollment in Ch 227 for Ch 221, Ch 228 for Ch 222 , and Ch 229 for Ch 223 is recommended. This is the first course in a sequence of three: Ch 221 , Ch 222, and Ch 223 . Ch 104 - Ch 109 does notsatisfy the first-year Chemistry requirement for most science and engineering majors.
Prerequisite: Math Department-approved placement into Mth 111 or Mth 112. High school chemis try or equivalent is recommended.

## Ch 221H- Honors General Chemistry I (4)

Honors General Chemistry will address the topics of general chemistry with a focus on the urban context and
the principles of green chemistry. Thecourse is designed to challenge well-prepared students and will utilize alternative modes of ins truction in smaller clas s sizes. Students will work in groups to address real world problems with the guidance of the lecture instructor. The course is limited to students admitted to the University Honors Program. Students should have taken at least one year of high-schoolchemistry.
Corequisite: Ch 227H.

## Ch 222 - General Chemistry II (4)

Fundamental basis of chemis try forscience, engineering and health professional students (such as predental, premedical, premedical technology and veterinary students). Concurrent enrollment in Ch 227 for Ch 221 , Ch 228 for Ch 222, and Ch 229 for Ch 223 is recommended. This is the second course in a sequence of three: Ch 221, Ch 222, and Ch 223 . Ch 104 - Ch 109 does notsatisfy the first-year Chemistry requirement for most science and engineering majors.

Prerequisite: Ch 221.

## Ch 222H-Honors General Chemistry II (4)

Honors GeneralChemis try will addres sthe topics of general chemistry with a focus on the urban context and the principles of green chemistry. Thecourse is designed to challenge well-prepared students and will utilize alternative modes of instruction in s maller clas s sizes. Students will work in groups to address real world problems with the guidance of the lecture instructor. The course is limited to students admitted to the University Honors Program. Students should have taken at least one yearofhigh-schoolchemistry.

Corequisite: Ch 228H.

## Ch 223 - General Chemistry III (4)

Fundamental basis of chemistry for science, engineering and health professional students (such as predental, premedical, premedical technology and veterinary students). Concurrent enrollment in Ch 227 for Ch 221, Ch 228 for Ch 222, and Ch 229 for Ch 223 is recommended. This is the third course in a sequence of three: Ch 221, Ch 222, and Ch 223. Ch 104 - Ch 109 does notsatisfy the first-year Chemistry requirement for most science and engineering majors.
Prerequisite: Ch 222.

## Ch 223H- Honors General Chemistry III (4)

Honors General Chemis try will address the topics of general chemistry with a focus on the urban context and the principles of green chemistry. Thecourse is designed to challenge well-prepared students and will utilize alternative modes of ins truction in s maller class sizes. Students will work in groups to address real world problems with the guidance of the lecture instructor. The
course is limited to students admitted to the University Honors Program. Students should have taken at least one year of high-school chemis try.
Corequisite: Ch 229 H .

## Ch 227-General Chemistry Laboratory (1)

Laboratory work to accompany General Chemis try (Ch 221, Ch 222, Ch 223). Concurrent enrollment in the appropriate lecture course is recommended. One 3-hour laboratory. This is the first lab in a sequence of three: Ch 227, Ch 228, and Ch 229.

Prerequisite: Ch 221 or concurrent enrollment.
Ch $\mathbf{2 2 7 H}$ - Honors Lab for Ch $\mathbf{2 2 1 H}$ (1)
Laboratory work to accompany Honors General Chemistry (Ch 221 H , Ch 222 H , Ch 223 H ). Completion of or concurrent enrollment in lecture required. One 3 -hour laboratory.
Corequisite: Ch 221 H .

## Ch 228-General Chemistry Laboratory (1)

Laboratory work to accompany General Chemistry (Ch 221, Ch 222, Ch 223). Concurrent enrollment in the appropriate lecture course is recommended. One 3-hour laboratory. This is the second lab in a sequence of three: Ch 227, Ch 228, and Ch 229.

Prerequisite: Ch 222 or concurrent enrollment.
Ch 228H- Honors Lab for Ch $\mathbf{2 2 2 H}$ (1)
Laboratory work to accompany Honors General Chemistry (Ch 221 H , Ch 222 H , Ch 223 H ). Completion of or concurrent enrollment in lecture required. One 3-hour laboratory.
Corequisite: Ch 222H.

## Ch 229 - General Chemistry Laboratory (1)

Laboratory work to accompany General Chemistry (Ch 221, Ch 222, Ch 223). Concurrent enrollment in the appropriate lecture course is recommended. One 3-hour laboratory. This is the third lab in a sequence of three: Ch 227, Ch 228, and Ch 229.
Prerequisite: Ch 223 or concurrent enrollment.
Ch 229H- Honors Lab for Ch $\mathbf{2 2 3 H}$ (1)
Laboratory work to accompany Honors General Chemistry (Ch 221 H , Ch 222 H , Ch 223 H ). Completion of or concurrent enrollment in lecture required. One 3 -hour laboratory.
Corequisite: Ch 223H.

## Ch 250 - Nutrition (4)

Nutritive value of foods from the standpoint of newer scientific investigations; nutritional requirements for
normal human beings; selection of an optimal diet for health; present-day problems in nutrition; recent trends in American dietary habits.

## Ch 284 - General Chemistry WorkshopI (1)

Optional peer-led problem-solving sessions designed to promote the success of students in Ch 221, Ch 222, Ch 223 general chemistry sequence. Corequisite: corresponding lecture course Ch 221, Ch 222, Ch 223. Pas s/nopass only. This is the first course in a sequence of three: Ch 284 , Ch 285, and Ch 286.

Corequisite: Ch 221.

## Ch 285 - General Chemistry WorkshopII (1)

Optional peer-led problem-solving sessions designed to promote the success of students in Ch 221, Ch 222, Ch 223 general chemistry sequence. Corequisite: corresponding lecture course Ch 221, Ch 222, Ch 223. Pass/nopass only. This is the second course in a sequence of three: Ch 284, Ch 285, and Ch 286.
Corequisite: Ch 222.

## Ch 286 -General Chemistry WorkshopIII (1)

Optional peer-led problem-solving sessions designed to promote the success of students in Ch 221, Ch 222, Ch 223 general chemistry sequence. Corequis ite: corresponding lecture course Ch 221, Ch 222, Ch 223. Pass/nopass only. This is the third course in a sequence of three: Ch 284, Ch 285, and Ch 286.

Corequisite: Ch 223.
Ch 299 -Special Studies (1-6)
(Credit to be arranged.)

## Ch 320 - Quantitative Analysis (4)

Fundamental principles of quantitative analy tical chemistry.

Prerequisite: Ch 223 and Ch 229.

## Ch 321 - Quantitative Analysis Laboratory (2)

Basic quantitative analytical laboratory work including volumetric and instrumental methods.

Prerequisite: Ch 320 or concurrent enrollment.

## Ch 327 -Elements of Organic Chemistry Laboratories

 I (2)Laboratory work to accompany the sequence of Ch 331, 332. One 4-hour laboratory period. Concurrentenrollment in Ch 331 is recommended.

Corequisite: Ch 331.

## Ch 328 -Elements of Organic Chemistry Laboratories II (2)

Laboratory work to accompany the sequence of Ch 331 , 332. One 4-hour laboratory period. Prerequisite: Ch 327. Concurrentenrollment in Ch 332 is recommended.

Prerequisite: Ch 327. Corequisite: Ch 332.

## Ch 331 -Elements of Organic Chemistry I(4)

Chemistry of the carbon compounds, the aliphatics, aromatics, and derivatives. The corresponding laboratory courses are Ch 327 , Ch 328 . This is the first course in a sequence of two: Ch 331 and Ch 332.
Prerequisite: Ch 223. Corequisite: Ch 327.
Ch 332 -Elements of Organic Chemistry II (4)
Chemistry of the carbon compounds, the aliphatics, aromatics, and derivatives. The corresponding laboratory courses are $\mathrm{Ch} 327, \mathrm{Ch} 328$. This is the second coursein a sequence of two: Ch 331 and Ch 332. Recommended prerequisite: Ch 331 ; concurrentenrollment in Ch 328 is recommended.
Corequisite:Ch 328 .

## Ch 334-Organic Chemistry I(4)

A comprehensive study of the chemistry of the compounds of carbon. Meets chemistry and biochemistry major requirements. The corresponding laboratory courses are Ch 337, Ch 339 forchemistry and biochemistry majors, and Ch 337, Ch 338 for non-chemistry majors. This is the first course in a sequenceof three: Ch 334 , Ch 335 , and Ch 336. Prerequisite:Ch 223. Concurrentenrollment in the laboratory course is recommended.
Prerequisite: Ch 223.

## Ch 335 - Organic Chemistry II (4)

A comprehensive study of the chemis try of the compounds of carbon. Meets chemistry and biochemistry major requirements. The corresponding laboratory courses are Ch 337, Ch 339 forchemistry and biochemistry majors, and Ch 337, Ch 338 for non-chemistry majors. This is the second course in a sequence of three: Ch 334 , Ch 335 , and Ch 336. Concurrent enrollment in the laboratory course is recommended.

Prerequisite:Ch 334.

## Ch 336 -Organic Chemistry III (4)

A comprehensive study of the chemis try of the compounds of carbon. Meets chemistry and biochemistry major requirements. The corresponding laboratory courses are Ch 337, 339 for chemistry andbiochemistry majors, andCh 337, 338 for non-chemistry majors. This is the third course in a sequence of three: Ch 334, Ch 335, and Ch 336. Concurrentenrollment in the laboratory course is recommended.

Prerequisite: Ch 335.
Ch 337 - Organic Chemistry Laboratory I (2)
Part one of the laboratory work to accompany the sequence of Ch 334, Ch 335, Ch 336. One 4-hour laboratory period.
Prerequisite: Ch 334 or concurrent enrollment.
Ch 338 -Organic Chemistry Laboratory II (nonmajors) (2)

Part two of the laboratory work to accompany the sequence Ch 334, Ch 335, Ch 336. One 4-hour laboratory period. Not open to chemistry majors.
Prerequisite: Ch 337 and Ch 335 orconcurrent enrollment in Ch 335.

## Ch 338R-Recitation for CH 337/CH338 (0)

Recitation forCh 337 and Ch 338.

## Ch 339 - Organic Chemistry Laboratory II (chem majors) (3)

Part two of the laboratory work to accompany the sequence Ch 334, Ch 335, Ch 336. More extensive laboratory course than Ch 338 ; required forchemistry and biochemistry majors. Two 4-hour laboratory periods.
Prerequisite: Ch 337 and Ch 336 or concurrent enrollment in Ch 336.

## Ch 350 -Biochemistry (4)

Biochemistry for students having a limited background in physical chemistry.
Prerequisite: Ch 229 and (Ch 332 orCh 336).

## Ch 360U - Origins of Life on Earth (4)

Scientific description of the chemicalevents leading to life on the Earth. Current and past theories of how life arose and experiments that support these ideas will be presented. Cultural and societal issues surrounding the origins of life will also be discussed. Expected preparation: one collegelevel course in biology, chemistry, geology, or physics.

## Ch 384 -Organic Chemistry WorkshopI (1)

Optional peer-led problem-solving sessions designed to promote the success of students in Ch 334, 335, 336 org anic chemistry sequence. Corequisite:corresponding lecture course Ch 334, 335, 336. Pass/no pass only. This is the first course in a sequence of three: $\mathrm{Ch} 384, \mathrm{Ch} 385$, and Ch 386.
Corequisite: Ch 334 .

## Ch 385 - Organic Chemistry WorkshopII (1)

Optional peer-led problem-solving sessions designed to promote the success of students in Ch 334, 335, 336 organic chemis try sequence. Corequisite: corresponding lecture course Ch 334, 335, 336. Pass/no pass only. This is the second course in a sequence of three: Ch 384, Ch 385, and Ch 386.

Corequisite: Ch 335.

## Ch 386 - Organic Chemistry WorkshopIII (1)

Optional peer-led problem-solving sessions designed to promote the success of students in Ch 334, 335, 336 org anic chemis try sequence. Corequisite: corresponding lecture course Ch 334, 335, 336. Pass/nopass only. This is the third course in a sequence of three: Ch 384, Ch 385, and Ch 386.

Corequisite: Ch 336.

## Ch 399 - Special Studies (1-6)

See department for course description. (Credit to be arranged.)

## Ch 399U- Special Studies (4)

(Credit to be arranged.)

## Ch 401 - Research (0-6)

Consent of instructor and chair of department. Credit will only be awarded after filing in the department office a well-written, detailed report approved by the instructor and the department chair. Ch 501 pass/no pass only. (Credit to be arranged.)

## Ch 402 - Independent Study (1-12)

(Credit to be arranged.)

## Ch 403 - Honor Thesis (1-4)

(Credit to be arranged.)

## Ch 404 - Cooperative Education/Internship (0-12)

See department for course description. (Credit to be arranged.)

## Ch 405 - Reading and Conference (0-6)

Consent of instructor and department chair. Ch 505 pass/no pass only. (Credit to be arranged.)

## Ch 406 - Chemical Preparations (1-2)

Methods of synthesis of compounds in the fields of inorganic, organic, or biochemistry. Maximum: 6 credits. Recommended prerequisites: consent of instructor and chair of department. (Credit to be arranged.)

## Ch 407 -Seminar (1-6)

Consentof instructor. Ch 507 pass/nopass only. (Credit to be arranged.)

## Ch 408 -WorkshopLeader (1-3)

Optional peer-led problem-solving sessions designed to promote the success of students in Chemistry. Corequisite: corresponding lecture course.

## Ch 410 -Selected Topics (1-6)

Consent of ins tructor and chair of department. (Credit to be arranged.)

## Ch 411 - Advanced Inorganic Chemistry I (4)

Atomic orbitals, ionic bonding, valence bond theory, molecular orbital theory, crystal field theory, and introduction to coordination theory.
Also offered for graduate-level credit as Ch 511 and may be taken only oncefor credit. . Prerequisite: Ch 223.

Ch 412 - Advanced Inorganic Chemistry II (4)
Ligand field theory, coordination chemistry, transition metals, organometallic chemistry, acids and bases, nonaqueous solvents, and descriptivechemistry of the elements.

Also offered for graduate-level credit as Ch 512 and may be taken only once for credit. . Prerequisite: Ch 411. Recommended prerequisites: Ch 442.

## Ch 412a - MODULE: Coordination Chemistry (2)

An exploration of bonding in metal complexes and the effect that bonding has on the properties of the complex. Including topics are: crystal field theory, molecular orbital theory, lig and field theory, pi-bonding, the chelate effect, electron counting.

Als o offered for graduate credit as Ch 512 a and may only be taken once forcredit. Prerequisite: Ch 411.

## Ch 412b- MODULE: Bioinorganic Chemistry (2)

This courses examines the way in which coordination chemistry and biochemistry intersect. It will examine how
the choice and/or coordination of particular metals affords properties beneficial to biological system.

Also offered for graduate credit as Ch 512b and may only be taken once for credit. Prerequisite: Ch 412a.

## Ch 416 - Physical Chemistry for the Biosciences I(4)

Intended primarily for students in the biological sciences and allied medical health fields. The emphasis is on the application of modern physical chemistry to problems of biologicalinterest. Ch 416 includes the study of heat, work, energy, entropy, vapor pressure, chemical equilibrium, and transport phenomena. Ch 417 covers chemical and enzyme kinetics, quantum chemistry, photochemistry, and spectroscopy. Courses must be taken in sequence. Recommended prerequisite: $\mathrm{Ch} 320,321$, a year of general physics with calculus, and two terms of calculus. Recommended prerequisites: Ch 223 and Ch 229.

## Ch 417 - Physical Chemistry for the Biosciences II (4)

Intended primarily for students in the biological sciences and allied medical health fields. The emphasis is on the application of modern physical chemistry to problems of biologicalinterest. Ch 416 includes the study of heat, work, energy, entropy, vapor pressure, chemical equilibrium, and transport phenomena. Ch 417 covers chemical and enzyme kinetics, quantumchemistry, photochemistry, and spectroscopy. Courses must be taken in sequence. Recommended prerequisite: Ch 320, 321, a year of general physics with calculus, and two terms of calculus. Recommended prerequisites: Ch 223 and Ch 229.

## Ch 418 - Advanced Chemistry Laboratory (4)

Advanced techniques and their use in the preparation of compounds. One lecture; two 3-hour laboratory periods. Expected preparation: Ch 338 or 339 .
Also offered for graduate-level credit as Ch 518 and may be taken only once for credit. .

## Ch 424 -Electronics and Instrumentation for Chemists (2)

Selected topics in chemical instrumentation will be presented at a bas ic level. Representative topics are current and voltage measurements, voltage dividers, simple filters, introduction to operational amplifiers and digital circuits. Requires concurrentenrollment in Ch 425/525. Expected preparation: Ch 320, Ch 321, Ph 203, and Ch 416 or Ch 440/540.
Also offered for graduate-level credit as Ch 524 and may be taken only once forcredit. .

## Ch 425 -Electronics and Instrumentation Laboratory

 (3)Laboratory work to accompany Ch 424/524. Two 3-hour lab periods. Requires concurrent enrollment in $\mathrm{Ch} 424 / 524$.
Also offered for graduate-level credit as Ch 525 and may be taken only oncefor credit.

## Ch 426 - Instrumental Analysis (4)

Theory and application of modern instrumental methods, including UV-visible, fluores cence, atomic absorption and emission, infrared, nuclear magnetic resonance, and mass spectrometry; potentiometry and voltammetry; gas and liquid chromatography, and capillary electrophoresis.
Also offered for graduate-level credit as Ch 526 and may be taken only once for credit.

## Ch 427 - Instrumental Analysis Laboratory (4)

Laboratory work to accompany Ch 426, including electrochemistry, chromatography, and atomic and molecular s pectroscopy ins truments. Writing intensive course. One 5-hour laboratory period, two 2-hour recitations.

Also offered for graduate-level credit as Ch 527 and may be taken only once for credit.

## Ch 430 - Advanced Organic Chemistry (4)

Advanced treatment of general organic reactions and structure; emphasis on bonding, stereochemistry, the correlation of structure and reactivity, scope and mechanis ms of organic reactions classified by reaction type. This is the first course in a sequence of two: Ch 430 and Ch 431. Expected preparation: Ch 336, 442/542, or 417/517.

Also offered for graduate credit as Ch 530 and may be taken only once for credit. .

## Ch 431 - Advanced Organic Chemistry (4)

Advanced treatment of general organic reactions and structure; emphasis on bonding, stereochemis try, the correlation of structure and reactivity, scope and mechanis ms of org anic reactions classified by reaction type. This is the second course in a sequence of two: Ch 430 and Ch 431. Expected preparation: Ch 336, 442/542, or 417/517.

Also offered for graduate credit as Ch 531 and may be taken only once for credit. .

## Ch 435 - Polymer Chemistry (4)

Fundamentals of polymers. Topics include polymer structures, molecular weights and determination, methods of polymerization including kinetics and statistics, testing and spectroscopy characterization of polymers, polymer composites and fillers, polymer reactions.

Also offered for graduate-level credit as Ch 535 and may be taken only once forcredit. .Prerequisite: Ch 336 .

## Ch 436 -Spectrometric Analysis (3)

Ultraviolet, infrared, nuclear magnetic res onance and mass spectrometry in the analysis of molecularstructure. Expected preparation: Ch 336 and Ch 339.

Also offered for graduate-level credit as Ch 536 and may be taken only once forcredit. .

## Ch 437 -Spectrometric Analysis Laboratory (1)

Use of infrared spectrometers and nuclear magnetic resonance spectrometers. One 3-hour laboratory period. Expected preparation:Ch 436/536 orconcurrent enrollment.

Also offered for graduate-level credit as Ch 537 and may be taken only once for credit. .

## Ch 440 - Physical Chemistry I(4)

The study of thermodynamics, phase and chemical equilibria, solutions, electrochemis try, reaction rates and mechanisms, quantummechanics, spectroscopy, electron trans port, molecular modeling and statistical mechanics. This is the first coursein a sequence of three: Ch 440 , Ch 441, and Ch 442. Expected preparation: $\mathrm{Ch} 320, \mathrm{Ph} 213$, and Mth 253.
Also offered for graduate-level credit as Ch 540 and may be taken only once forcredit. .

## Ch 441 - Physical Chemistry II (4)

The study of thermodynamics, phase and chemical equilibria, solutions, electrochemistry, reaction rates and mechanisms, quantum mechanics, spectroscopy, electron trans port, molecular modeling and statistical mechanics. This is the second course in a sequence of three: Ch 440 , Ch 441, and Ch 442. Expected preparation: $\mathrm{Ch} 320, \mathrm{Ph}$ 213, and Mth 253.
Also offered for graduate-level credit as Ch 541 and may be taken only once forcredit. .Prerequisite: Ch 440.

## Ch 442 - Physical Chemistry III (4)

The study of thermodynamics, phase and chemical equilibria, solutions, electrochemistry, reaction rates and mechanisms, quantummechanics, spectroscopy, electron transport, molecular modeling and statistical mechanics. This is the third course in a sequence of three: $\mathrm{Ch} 440, \mathrm{Ch}$ 441, and Ch 442. Expected preparation: Ch 320, Ph 213, and Mth 253.

Also offered for graduate-level credit as Ch 542 and may be taken only once forcredit..

## Ch 443 -Numerical Data Analysis and Modeling in Chemistry (2)

The study of statistical analy sis of experimental data and modeling of chemical systems using modern computational resources.
Also offered for graduate-level credit as Ch 543 and may be taken only once for credit. . Prerequisite: Ch 320/321, and Ph 223 or Ph 213. Concurrent enrollment in Ch 440/540 recommended.

## Ch 444 -Physical Chemistry Laboratory (2)

Laboratory work to accompany Ch 441/541, 442/542. One 4-hour laboratory period. This is the first lab in a sequence of two: Ch 444 and Ch 445 . Expected preparation: Ch 321 and concurrent enrollment in Ch 441/541, 442/542 respectively.
Also offered for graduate-level credit as Ch 544 and may be taken only once for credit. .

## Ch 445 -Physical Chemistry Laboratory (2)

Laboratory work to accompany Ch 441/541, 442/542. One 4-hour laboratory period. This is the second lab in a sequence of two: Ch 444 and Ch 445 . Expected preparation: Ch 321 and concurrent enrollment in Ch 441/541, 442/542 respectively.
Also offered for graduate-level credit as Ch 545 and may be taken only once for credit. .

## Ch 446 -Module: Biophysical methods I (2)

This 5-week intensive course covers the principle methodologies used to study biological macromolecules at the 'atomic-level' (e.g. X-ray Crystallography, NMR Spectroscopy and Electron Microscopy). Students will learn the underling principles, practical as pects and means for validation and assessment applied to these techniques.
Also offered for graduate-level credit as Ch 546 and may be taken only once for credit. Prerequis ite: (Ch 490 or Ch 350) and (Ph 203 or Ph 213).

## Ch 451 -Materials Chemistry Laboratory (3)

A suite of laboratory experiments in modern materials chemistry. Topics include nonmolecular inorganic solids (semiconductors, superconductors, sols, and gels), thin polymeric films, magnetic and photonic materials. Equal emphas is is placed on synthesis and physical characterization. Expected preparation: Ch 338 orCh 339.
Also offered for graduate-level credit as Ch 551 and may be taken only once for credit. .

## Ch 460 - Prebiotic Chemistry (4)

Reaction pathways for the abiological production of molecules involved in biological information flow. Expected Preparation: completion or concurrentenrollment in Ch 492/592.

Also offered for graduate-level credit as Ch 560 and may be taken only once for credit. .

## Ch 470 - NMR Spectroscopy (4)

Nuclear magnetic resonance spectroscopy theory and practice. Basic quantumtheory of magnetic moments, the semi-classical vector model of spins, and the product operator formalis mwill be applied using a variety of NMR spectroscopic techniques. Expected preparation: Ch 417 or Ch 442.

Also offered for graduate-level credit as Ch 570 and may be taken only once forcredit. .

## Ch 470c - MODULE: Practical NMR Spectroscopy (2)

This course will focus on the practical as pects of obtaining NMR spectroscopic data frominstrumentation such as one would encounter in a research or industrial setting.

Also offered for graduate-level credit as Ch 570c and may be taken only once forcredit. Prerequisite: Ch 417 or Ch 442.

## Ch 471 - Biological NMR Spectroscopy (4)

Nuclear magnetic res onance spectroscopy (NMR) of biologicals ystems. The basic theory of NMR, its application to complexbiological molecules and complexes. Expected preparation: Ch 470/570.

Also offered for graduate-level credit as Ch 571 and may be taken only once forcredit. .

## Ch 471a - MODULE: Biological NMR Spectroscopy (2)

Nuclear magnetic resonance spectroscopy (NMR) of biological systems. The basic theory of NMR, its application to complexbiological molecules and complexes. This course will bring the student an understanding of the application of NMR to biological systems, which is important because this is different to small-molecule NMR. There is also a large and expanding literature in biologicalNMR, that the upon which students may be able to model their research projects.

Also offered for graduate-level credit as Ch 571a and may be taken only once forcredit. Prerequisite: Ch 470.

## Ch 486 - Environmental Chemistry (4)

Survey of chemical aspects of major environmental is sues: stratospheric ozone holes and chlorofluorocarbons; air pollution; global climate change; fossil fuelenergy/"carbon footprint"; renewable energy; nuclear energy/radioactivity; toxic chemicals (pesticides, PCBs); endocrine disruptors; surfactants, chemical dispersants/oil spills;
biodegradability of chemicals; chemistry of natural waters/acid rain; toxic heavy metals. This is the same course as CE486 and can be taken only once for credit.

Prerequisite: Ch 334 or Ch 331. Cross-Listed as: CE486.

## Ch 487 - Aquatic Chemistry (4)

Aqueous chemistry in natural water systems: simple-tocomplex acid/base chemis try; titration curves; buffer strength; acid/base chemis try of carbon dioxide in open and closed systems; alkalinity as system variable (blood); mineral dis solution/precipitation(metal carbonates); redox chemistry: pe-pH, redoxsuccession/organic
loading/dissolved oxy gen loss, nitrate reduction, iron oxide dissolution, hydrogen sulfide production, methane formation. This is the same course as CE487 and can be taken only once for credit.

Prerequisite: Ch 223. Cross-Listed as: CE 487.

## Ch 490 -Biochemistry: Structure and Function (4)

First term of a three-termcourse for students preparing for professional biochemical work. Structures of biological molecules and assemblies, including proteins, nucleic acids, and lipids, and how these structures give rise to their biological functions. Expected preparation: Ch 336.
Recommended pre-or corequisites: Ch 416 or Ch 440/540, Ch 320/321, and Bi 253.

Also offered for graduate-level credit as Ch 590 and may be taken only once for credit. .

## Ch 491 -Biochemistry: Enzymology and Metabolism

 (4)Second term of a three-termcourse for students preparing for professional biochemical work. Basic principles of enzyme catalys is and mechanism, the chemistry and energetics of the primary metabolic pathways res ponsible for life, including glycolysis/glyconeogenesis, citric acid cycle, lipid and amino acid metabolism, oxidative phosphorylation, and photosynthesis.
Also offered for graduate-level credit as Ch 591 and may be taken only once for credit. . Prerequisite: Ch 490.

## Ch 492 -Biochemistry: Nucleic Acids andBiological Information Flow (4)

Third term of a three-termcourse for students preparing for professional biochemical work. Structure and function of nucleotides and nucleic acids. Biochemical detail of DNA replication, RNA transcription, and protein translation.
Also offered for graduate-level credit as Ch 592 and may be taken only once for credit. . Prerequisite: Ch 491.

## Ch 493 -Biochemistry Laboratory (3)

Introduction to general techniques of biochemistry including purification and characterization of enzymes. One 4-hour laboratory period, plus one hour of lecture. Expected preparation: Ch 491/591 or concurrent enrollment.
Also offered for graduate-level credit as Ch 593 and may be taken only once for credit. .

## Ch 496 - Synthetic Biology (4)

Advanced seminar-style class surveying the applied interdisciplinary field of synthetic biology. Topics on engineering and design of new microbial cells include: minimal gene sets, large scale genome as sembly, manipulation of metabolic pathways, and alteration of the genetic code. Required preparation: Organic Chemistry AND either Biochemistry or Molecular Biology. Corequisite: Ch 492 or $\operatorname{Bi} 334$ (forstudents who completed Ch 491 but neither Ch 350 nor Bi 334 ).

Prerequisite: Ch 335. Grade of B- or better in Ch 491 or Ch 350 or Bi 334.

Ch 497 - Module: Nucleic Acids (2)
Chemical and physical features and functions of DNA and RNA primary, secondary and tertiary structures and protein recognition; unusual DNA structures; chromatin organization; thermodynamics ofDNA sequence dependent stability, RNA secondary structure prediction and RNA folding; chemistry and thermodynamics of structure/functional mechanisms of ribozymes, large DNAprotein and RNA-protein complexes
Also offered for graduate-level credit as Ch 597 and may be taken only once forcredit. Prerequisite: Ch 492.

## Ch 498 - MODULE: Protein Dynamics and Folding (2)

This 5-week intensive course will develop an ad vanced understanding of the molecular forces that govern protein structure, folding and dynamics. We will discuss the theoretical as pects used to describe these principles, as well as the methods used to experimentally characterize and computationally model protein folding and dynamics.
Also offered for graduate-level credit as Ch 598 and may be taken only once forcredit. Prerequisite: (Ch 490 or Ch 350) and ( Ph 203 or Ph 213 ) and Mth 251 and Mth 252.

## Ch 501 - Research (1-9)

Consent of instructor and chair of department. Credit will only be awarded after filing in the department office a well-written, detailed report approved by the instructor and the department chair. Ch 501 pass/nopass only. (Credit to be arranged.)

## Ch 502 - Independent Study (1-4)

(Credit to be arranged.)

## Ch 503 - Thesis (1-9)

See department for course description. Pass/no pass only. (Credit to be arranged.)

## Ch 504 - Cooperative Education/Internship (0-9)

See department for course description. (Credit to be arranged.)

## Ch 505 - Reading and Conference (0-6)

Consentof instructor and department chair. Ch 505 pass/no pass only. (Credit to be arranged.)

## Ch 507 -Seminar (1-6)

Consentof instructor. Ch 507 pass/nopass only. (Credit to be arranged.)

## Ch 510 -Selected Topics (1-6)

Consentof instructor and chair of department. (Credit to be arranged.)

## Ch 511 - Advanced Inorganic Chemistry I (4)

Atomic orbitals, ionic bonding, valence bond theory, molecular orbital theory, crystal field theory, and introduction to coordination theory.
Also offered for undergraduate-level credit as Ch 411 and may be taken only once for credit.

## Ch 512 -Advanced Inorganic Chemistry II (4)

Ligand field theory, coordination chemistry, transition metals, organometallic chemistry, acids and bases, nonaqueous solvents, and descriptive chemis try of the elements.

Also offered for undergraduate-level credit as Ch 412 and may be taken only once for credit. . Prerequis ite: Ch 411. Recommended prerequisites: Ch 442.

## Ch 512a-MODULE: Coordination Chemistry (2)

An exploration of bonding in metal complexes and the effect that bonding has on the properties of the complex. Including topics are: crystalfield theory, molecular orbital theory, lig and field theory, pi-bonding, the chelate effect, electron counting.

Als o offered for undergraduate credit as Ch 412a and may only be taken once for credit. Prerequisite: Ch 511.

## Ch 512b- MODULE: Bioinorganic Chemistry (2)

This courses examines the way in which coordination chemistry and biochemis try intersect. It will examine how the choice and/or coordination of particular metals affords properties beneficial to biological system.

Also offered for undergraduate credit as Ch 412b and may only be taken once for credit. Prerequisite: Ch 512 a .

## Ch 515 - Selected Topics in Inorganic Chemistry (3)

Current topics in inorganic chemis try such as advances in oxidation, solution chemistry, and fluorine chemistry. As subject matter varies, course may be repeated with consent of instructor.
Also offered as Ch 615. Prerequisite: Ch 511.

## Ch 516 - Physical Chemistry for the Biosciences I(4)

Intended primarily for students in the biological sciences and allied medical health fields. The emphasis is on the application of modern physical chemistry to problems of biologicalinterest. Ch 416 includes the study of heat, work, energy, entropy, vapor pressure, chemical equilibrium, and transport phenomena. Ch 417 covers chemical and enzyme kinetics, quantumchemistry, photochemistry, and spectroscopy. Courses must be taken in sequence. Recommended prerequisite: Ch 320, 321, a year of general physics with calculus, and two terms of calculus. Recommended prerequisites: Ch 223 and Ch 229.

## Ch 517 - Physical Chemistry for the Biosciences II(4)

Intended primarily for students in the biological sciences and allied medical health fields. The emphasis is on the application of modern physical chemistry to problems of biologicalinterest. Ch 416 includes the study of heat, work, energy, entropy, vapor pressure, chemical equilibrium, and transport phenomena. Ch 417 covers chemical and enzyme kinetics, quantumchemistry, photochemistry, and spectroscopy. Courses must be taken in sequence. Recommended prerequisite: Ch 320, 321, a year of general physics with calculus, and two terms of calculus. Recommended prerequisites: Ch 223 and Ch 229.

## Ch 518 - Advanced Chemistry Laboratory (4)

Advanced techniques and their use in the preparation of compounds. One lecture; two 3-hour laboratory periods. Expected preparation: Ch 338 or 339 .

Also offered for undergraduate-level credit as Ch 418 and may be taken only once for credit. .

## Ch 524 - Electronics and Instrumentation for Chemists

 (2)Selected topics in chemical instrumentation will be presented at a bas ic level. Representative topics are current and voltage measurements, voltage dividers, simple filters, introduction to operational amplifiers and digital circuits. Requires concurrentenrollment in $\mathrm{Ch} 425 / 525$. Expected preparation: Ch 320, Ch 321, Ph 203, and Ch 416 or Ch 440/540.

Also offered for undergraduate-levelcredit as Ch 424 and may be taken only once for credit. .

## Ch 525 -Electronics and Instrumentation Laboratory

 (3)Laboratory work to accompany Ch 424/524. Two 3-hour lab periods. Requires concurrent enrollment in $\mathrm{Ch} 424 / 524$.
Also offered for undergraduate-level credit as Ch 425 and may be taken only once for credit.

## Ch 526 - Instrumental Analysis (4)

Theory and application of modern instrumental methods, including UV-visible, fluorescence, atomic absorption and emission, infrared, nuclear magnetic resonance, and mass spectrometry; potentiometry and voltammetry; gas and liquid chromatography, and capillary electrophoresis.
Also offered for undergraduate-level credit as Ch 426 and may be taken only once for credit.

## Ch 527 - Instrumental Analysis Laboratory (4)

Laboratory work to accompany Ch 526, including electrochemistry, chromatography, and atomic and molecular s pectroscopy ins truments. Writing intensive course. One 5-hour laboratory period, two 2-hour recitations.

Also offered for undergraduate-level credit as Ch 427 and may be taken only once for credit.

## Ch 530 - Advanced Organic Chemistry (4)

Advanced treatment of general organic reactions and structure; emphasis on bonding, stereochemistry, the correlation of structure and reactivity, scope and mechanis ms of org anic reactions classified by reaction type. This is the first course in a sequence of two: Ch 530 and Ch 531. Expected preparation: Ch 336, 442/542, or 417/517.

Also offered for undergraduate credit as Ch 430 and may be taken only once for credit. .

## Ch 531 - Advanced Organic Chemistry (4)

Advanced treatment of general organic reactions and structure; emphasis on bonding, stereochemistry, the correlation of structure and reactivity, scope and mechanis ms of org anic reactions clas sified by reaction type. This is the second course in a sequence of two: Ch 530 and Ch 531. Expected preparation: Ch 336, 442/542, or 417/517.

Also offered for undergraduate credit as Ch 431 and may be taken only once for credit. .

## Ch 535 - Polymer Chemistry (4)

Fundamentals of polymers. Topics include polymer structures, molecular weights and determination, methods of polymerization including kinetics and statistics, testing and spectroscopy characterization of polymers, polymer composites and fillers, polymer reactions.

Also offered for undergraduate-levelcredit as Ch 435 and may be taken only once for credit. . Prerequisite: Ch 336.

## Ch 536 -Spectrometric Analysis (3)

Ultraviolet, infrared, nuclear magnetic resonance and mas s spectrometry in the analy sis of molecular structure. Expected preparation: Ch 336 and Ch 339.

Also offered for undergraduate-levelcredit as Ch 436 and may be taken only once for credit. .

## Ch 537 -Spectrometric Analysis Laboratory (1)

Use of infrared spectrometers and nuclear magnetic res onance spectrometers. One 3-hour laboratory period. Expected preparation: Ch 436/536 or concurrent enrollment.

Also offered for undergraduate-levelcredit as Ch 437 and may be taken only once for credit. . Prerequisite: Ch 536 (concurrent enrollment allowed).

## Ch 540 - Physical Chemistry (4)

The study of thermodynamics, phase and chemical equilibria, solutions, electrochemis try, reaction rates and mechanisms, quantummechanics, spectroscopy, electron trans port, molecular modeling and statistical mechanics. This is the first course in a sequence of three: Ch 540, Ch 541, and Ch 542. Expected preparation: Ch 320, Ph 213, and Mth 253.

Also offered for undergraduate-level credit as Ch 440 and may be taken only once for credit. .

## Ch 541 - Physical Chemistry (4)

The study of thermodynamics, phase and chemical equilibria, solutions, electrochemistry, reaction rates and mechanisms, quantummechanics, spectroscopy, electron trans port, molecular modeling and statistical mechanics. This is the second course in a sequence of three: Ch 540, Ch 541, and Ch 542. Expected preparation: Ch 320, Ph 213, and Mth 253.

Also offered for undergraduate-level credit as Ch 441 and may be taken only once for credit. .

## Ch 542 -Physical Chemistry (4)

The study of thermodynamics, phase and chemical equilibria, solutions, electrochemistry, reaction rates and mechanisms, quantummechanics, spectroscopy, electron trans port, molecular modeling and statistical mechanics. This is the third course in a sequence of three: $\mathrm{Ch} 540, \mathrm{Ch}$ 541, and Ch 542. Expected preparation: $\mathrm{Ch} 320, \mathrm{Ph} 213$, and Mth 253.

Also offered for undergraduate-levelcredit as Ch 442 and may be taken only once for credit. .

## Ch 543 - Numerical Data Analysis and Modeling in Chemistry (2)

The study of statistical analysis of experimental data and modeling of chemical systems using modern computational resources.
Also offered for undergraduate-level credit as Ch 443 and may be taken only once for credit. . Prerequisite: Ch 320/321, and Ph 223 orPh 213. Concurrent enrollment in Ch 440/540 recommended.

## Ch 544 - Physical Chemistry Laboratory (2)

Laboratory work to accompany Ch 441/541, 442/542. One 4-hour laboratory period. This is the first lab in a sequence of two: Ch 544 and Ch 545. Expected preparation: Ch 321 and concurrent enrollment in Ch 441/541, 442/542 respectively.

Also offered for undergraduate-level credit as Ch 444 and may be taken only once for credit. .

## Ch 545 -Physical Chemistry Laboratory (2)

Laboratory work to accompany Ch 441/541, 442/542. One 4-hour laboratory period. This is the second lab in a sequence of two: Ch 544 and Ch 545. Expected preparation: Ch 321 and concurrent enrollment in Ch $441 / 541,442 / 542$ respectively.

Also offered for undergraduate-level credit as Ch 445 and may be taken only once forcredit. .

## Ch 546 -MODULE: Biophysical Methods I (Macromolecular Structure) (2)

This 5-week intensive course covers the principle methodologies used to study biological macromolecules at the 'atomic-level' (e.g. X-ray Crystallography, NMR Spectroscopy and Electron Microscopy). Students will learn the underling principles, practical as pects and means for validation and assessment applied to these techniques.
Also offered for undergraduate-level credit as Ch 446 and may be taken only once for credit. Prerequisite: (CH490 or CH350) and (PH203 or PH213).

## Ch 551 -Materials Chemistry Laboratory (3)

A suite of laboratory experiments in modern materials chemistry. Topics include nonmolecular inorganic solids (semiconductors, superconductors, sols, and gels), thin polymeric films, magnetic and photonic materials. Equal emphas is is placed on synthesis and physical
characterization. Expected preparation: Ch 338 or Ch 339.
Also offered for undergraduate-level credit as Ch 451 and may be taken only once for credit. .

## Ch 560 - Prebiotic Chemistry (4)

Reaction pathways for the abiological production of molecules involved in biological information flow.

Expected Preparation: completion or concurrentenrollment in Ch 492/592.

Also offered for undergraduate-levelcredit as Ch 460 and may be taken only once for credit. .

## Ch 570 - NMR Spectros copy (4)

Nuclear magnetic res onance spectroscopy theory and practice. Bas ic quantum theory of magnetic moments, the semi-classical vector model of spins, and the product operator formalis mwill be applied using a variety of NMR spectroscopic techniques. Expected preparation: Ch 417 or Ch 442.

Also offered for undergraduate-levelcredit as Ch 470 and may be taken only once for credit. .

## Ch 570c - MODULE: Practical NMR Spectroscopy (2)

This course will focus on the practical as pects of obtaining NMR spectroscopic data frominstrumentation such as one would encounter in a research or industrial setting.
Also offered for undergraduate-level credit as Ch 470 c and may be taken only once for credit. Prerequisite: Ch 417 or Ch 442.

## Ch 571 - Biological NMR Spectroscopy (4)

Nuclear magnetic resonance spectroscopy (NMR) of biological systems. The basic theory of NMR, its application to complexbiological molecules and complexes. Expected preparation: Ch 470/570.
Also offered for undergraduate-levelcredit as Ch 471 and may be taken only once for credit. .

## Ch 571a - MODULE: Biological NMR Spectroscopy (2)

Nuclear magnetic resonance spectroscopy (NMR) of biologicals ystems. The basic theory of NMR, its application to complexbiological molecules and complexes.
Also offered for undergraduate-level credit as Ch 471a and may be taken only once for credit. Prerequisite: Ch 470.

## Ch 586 - Environmental Chemistry (4)

Survey of chemical as pects of major environmental issues: stratospheric ozone holes and chlorofluorocarbons; air pollution; global climate change; fossil fuel energy/"carbon footprint"; renewable energy; nuclear energy/radioactivity; toxic chemicals (pesticides, PCBs); endocrine disruptors; surfactants, chemical dispersants/oil spills; biodegradability of chemicals; chemistry of natural waters/acid rain; toxic heavy metals. This is the same course as CE586 and can be taken only once for credit.
Prerequisite: Ch 334 or Ch 331. Cross-Listed as: CE586.

## Ch 587 - Aquatic Chemistry (4)

Aqueous chemistry in natural water sy stems: simple-tocomplex acid/base chemis try; titration curves; buffer strength; acid/base chemistry of carbon dioxide in open and closed systems; alkalinity as system variable (blood); mineral dis solution/precipitation (metal carbonates); redox chemistry: pe-pH, redoxsuccession/organic
loading/dissolved oxygen loss, nitrate reduction, iron oxide dissolution, hydrogen sulfide production, methane formation. This is the same course as CE587 and can be taken only once for credit.
Prerequisite: Ch 223. Cross-Listed as: CE 587.

## Ch 590 -Biochemistry: Structure and Function (4)

First term of a three-termcourse for students preparing for professional biochemical work. Structures of biological molecules and assemblies, including proteins, nucleic acids, and lipids, and how these structures give rise to their biological functions. Expected preparation: Ch 336.
Recommended pre-orcorequisites: Ch 416 or Ch 440/540, Ch 320/321, and Bi 253.
Also offered for undergraduate-level credit as Ch 490 and may be taken only once for credit. .

## Ch 591 -Biochemistry: Enzymology and Metabolism

 (4)Second term of a three-termcourse for students preparing for professional biochemical work. Basic principles of enzyme catalys is and mechanis $m$, the chemistry and energetics of the primary metabolic pathways res ponsible for life, including glycolysis/glyconeogenesis, citric acid cycle, lipid and amino acid metabolism, oxidative phosphorylation, and photosynthesis. Expected preparation: Ch 490/590.
Also offered for undergraduate-level credit as Ch 491 and may be taken only once for credit. .

## Ch 592 - Biochemistry: Nucleic Acids andBiological Information Flow (4)

Third term of a three-termcourse for students preparing for professional biochemical work. Structure and function of nucleotides and nucleic acids. Biochemical detail of DNA replication, RNA transcription, and protein translation. Expected preparation: Ch 490/590 and Ch 491/591.
Also offered for undergraduate-level credit as Ch 492 and may be taken only once for credit. .

## Ch 593 - Biochemistry Laboratory (3)

Introduction to general techniques of biochemistry including purification and characterization of enzymes. One 4-hour laboratory period, plus one hour of lecture. Expected preparation: Ch 491/591 or concurrent enrollment.

Also offered for undergraduate-levelcredit as Ch 493 and may be taken only once for credit. .

## Ch 596 -Synthetic Biology (4)

Advanced seminar-style class surveying the applied interdis ciplinary field of synthetic biology. Topics on engineering and design of new microbial cells include: minimal gene sets, large scale genome as sembly, manipulation of metabolic pathways, and alteration of the genetic code. Required preparation: Org anic Chemistry AND either Biochemistry or Molecular Biology. Corequisite: Ch 492 or Bi 334 (for students who completed Ch 491 but neither Ch 350 nor Bi 334).
Prerequisite: Ch 335. Grade of B- or better in Ch 491 or Ch 350 or Bi 334.

## Ch 597 -MODULE: Nucleic Acids (2)

Chemical and physical features and functions of DNA and RNA primary, secondary and tertiary structures and protein recognition; unusual DNA structures; chromatin organization; thermodynamics of DNA sequence dependent stability, RNA secondary structure prediction and RNA folding; chemistry and thermodynamics of structure/functional mechanisms of ribozymes, large DNAprotein and RNA-protein complexes.

Also offered for undergraduate-levelcredit as Ch 497 and may be taken only once forcredit. Prerequisite: Ch 592.
Ch 598 - MODULE: Protein Dynamics and Folding (2)
This 5-week intensive course will develop an advanced understanding of the molecular forces that govern protein structure, folding and dynamics. We will discuss the theoretical as pects used to describe these principles, as well as the methods used to experimentally characterize and computationally model protein folding and dynamics.
Also offered for undergraduate-level credit as Ch 498 and may be taken only once for credit. Prerequisite: (CH490 or CH 350) and (PH203 or PH 213) and Mth 251 and Mth 252.

## Ch 601 - Research (1-9)

See department for course description. Pass/no pass only. (Credit to be arranged.)

## Ch 602 - Independent Study (1-9)

(Credit to be arranged.)

## Ch 603 - Dissertation (1-12)

See department for course description. (Credit to be arranged.)

## Ch 604 -Cooperative Education/internship(1-9)

See department for course description. (Credit to be arranged.)

## Ch 605 - Reading and Conference (0-9)

See department for course description. Pass/no pass only. (Credit to be arranged.)

## Ch 606 -Projects (1-9)

(Credit to be arranged.)

## Ch 607 -Seminar (1-9)

See department for course description. Pass/no pass only. (Credit to be arranged.)

## Ch 610 -Selected Topics (1-9)

See department for course description. (Credit to be arranged.)

## Ch 615 -Selected Topics in Inorganic Chemistry (3)

Current topics in inorg anic chemistry such as advances in oxidation, solution chemistry, and fluorine chemistry. As subject matter varies, course may be repeated with consent of instructor.
Prerequisite: Ch 511. Cross-Listed as: Also offered as Ch 515. .

## Ch 621 - Advanced Analytical Theory (3)

Modern methods of analysis and their application to the analytical chemistry of elements.
Prerequisite: Ch 425/525 and 442/542.

## Ch 633 - Organic Synthesis (3)

Organic reactions, mechanisms and stereochemistry with application to multi-step synthesis. Recommended prerequisite: Ch 431/531.

## Ch 634 - Advanced Topics in Organic Chemistry (3)

Current topics such as stereochemis try, natural products, pericyclic reactions, carboniumions, heterocyclic and polycyclic compounds, org anic photochemistry. As subject matter varies, course may be repeated with consent of instructor. Recommended prerequisite: Ch 431/531.

## Ch 635 - Physical Organic Chemistry (3)

Modern concepts of physical-org anic chemistry and their use in the study of mechanisms of organic reactions and reactivities of organic compounds. Recommended prerequisite: Ch 431/531.

## Ch 661 - Photochemistry (3)

An introduction to the chemistry of the interaction of light with matter. Absorption and emis sion of light, photochemical and photophysical processes, photochemical kinetics and mechanisms. Reactivity of excited states of molecules and atoms.
Prerequisite: Ch 441/541.
Ch 662 - Chemical Kinetics (4)
Chemical kinetics in the gas phase and in solution, catalysis, and absoluterate theory.
Prerequisite: Ch 442/542.

## Ch 663 - Chemical Thermodynamics (3)

The laws of thermodynamics and their applications.
Prerequisite: Ch 442/542.

## Ch 665 -Statistical Thermodynamics (3)

Foundations of the subject with application to the equilibriumthermodynamics of gases, liquids, and solids.

Prerequisite: Ch 664.

## Ch 670 - Atmospheric Chemistry (3)

Physical chemistry of the earth's atmosphere, including global chemical budgets, atmospheric thermodynamics, photo-chemicalreactions in the lower and upper atmosphere, chemical properties of aerosols, and global climate change.

Prerequisite: Ch 442/542.

## Ch 693 - Enzyme Structure and Function (4)

Chemical and physical properties of enzymes; energetics, kinetics, and mechanismof enzymatic reactions.
Prerequisite: Ch 492/592.

## Ch 694 - Nucleic AcidStructure and Function (4)

Comprehensive examination of nucleic acid structurefunction relationships at the molecular level. Geometry of DNA and RNA will be presented, along with the impact this has on geneexpression. DNA structural thermodynamics and RNA-directed catalysis will also be covered.

Prerequisite: completion of a full year of undergraduatelevel biochemistry (Ch 490, 491, 492).

## Ch 695 -Advances in Biochemistry (3)

Current topics in biochemistry such as neurobiochemistry, membrane structure, differentiation, metabolic regulation, bioenergetics, nucleic acids. As subject matter varies, course may be repeated with consent of ins tructor.
Prerequisite: Ch 492/592.
Ch 699 -Special Studies (1-6)
(Credit to be arranged.)

## ChLa - Chicano-Latino

## ChLa 201 - Introduction to Chicano/LatinoStudies (4)

An introductory history of Latinos in the United States. Beginning with Spanish colonization and moving to the recent migration of Latin and South Americans in the 1970s, 1980s, and early 1990s. Special attention will be given to particular events that shaped and influenced the Latino experience, such as the Mexican-American War, Repatriation, Bracero Program, World War II, War on Poverty, the ChicanoMovement, and U.S. foreign policy in Latin America.

## ChLa 301U - Chicano/Latino Communities (4)

Contemporary sociological studies and theory used to understand and explain the status of Chicanos and Latinos in the U.S. Topics will include family, gender relations, immigration, work and employment, inter- and intra-ethnic and racial relations in the community.

## ChLa 302U - Survey of Chicano/Latino Literature (4)

A representative overview of Chicano/Latino literature covering poetry, theater, novel, short story, and essay. The course will include literary techniques, modes of expression, trends in Chicano and Latino creativity, critical approaches, and will expose students to available bibliographic resources in the field.

## ChLa 303U - Chicana/Latina Experience (4)

The social, political, and literary experience of women in the Chicano and Latino communities. The women's perspective and position in historicalevents, community org anizing, and social is sues will be explored through literature, art, music, and socialscience research.

## ChLa 305-Latinx Youth Cultures (4)

Multidis ciplinary examination of Latinxyouth cultures and expressions to interrogate questions of gender, Latinx identities, white supremacy, sexism, homophobia, and transphobia. Class will examine how Latinx youth have been instrumental in shaping and changing their communities through their resilience, creativity, and activism.

## ChLa 325 - Mexican American/Chicano History I, 1492-1900 (4)

Mexican American/Chicano/ahistory fromthe Conquest of the Americas to 1900 with an emphas is on empire, civil rights, identity, culture, sexuality, and war. This is the same course as Hst 325 and may be taken only once for credit.

Cross-Listed as: Hst 325.

## ChLa 326U- Mexican American/Chicano History II, 1900-Present (4)

Mexican American/Chicano/ahistory from 1900 to the present with an emphasis on migration, ethnicity, labor, civil rights, identity, and culture. This is the same course as Hst 326 U and may be taken only once for credit.
Cross-Listed as: Hst 326U.

## ChLa 330U- Latino Popular Culture (4)

Explores a wide scopeof Latino popular culture: highly produced entertainment (television, radio, film, magazines); commercial and noncommercial musical and artistic expression;popular celebrations; and the culture of "everyday life," fromtraditional folklore to newly invented customs and rituals.Popular culture is examined to reveal how Latino groups (Mexicans, Cubans, Dominicans, Puerto Ricans, etc.), reinvent their culture, heritage, and ethnic identity in the United States, and how Latinos in the process are changing A merican popular culture and nationalidentity. Students will become familiar with theories of popular culture and get hands-on experience inves tigating a Latino popular culture form.

## ChLa 331U- Barrio Culture: Art and Literature (4)

A focus on barrio communities as a construction model to Chicano/LatinoStudies yields barrio cultures as dynamic sites of historical, visual and cultural production. Examination of traditions, lifestyles, and values of Chicana/Chicano communities and representations of legends, icons, and stereotypes through literature, music, media, cinema, and history.

## ChLa 335 - Chicano/Latin American Film (4)

Exploration of Chicano/Latin American film through close readings of representative films from each of the following major periods: silent cinema (1890s-1930s), studio cinema (1930s-1950s), Neorealism/Art Cinema (1950s), the New Latin American Cinema (1960s-1980s), and contemporary cinema (1990s to today). Examine representations to different constructions of gender, race, sexuality, and nationality.

## ChLa 340 - Mayas, Aztecs, and Chicanos (4)

Will focus on the flourishing of Mayan civilization and the cultural and artistic contributions of other Mesoamerican societies, such as the Aztecs, during the Clas sic and PostClassic period. The fall of the Aztec so-called empire will be studied, including the first years of New Spain's viceregal society, which saw the beginning of clas s and race relations. Early-Mexican identity will be explored during this period, including its relations to Chicano identity.

## ChLa 341 - Latinx Philos ophy (4)

Latinx Philosophy will explore the philos ophical contributions of indigenous, Hispanic, and Latinxthinkers in the Americas and in the Iberian Peninsula, situating philosophical thought in its social and political contexts. Students will grapple with the questions of Latinx identity and philosophy, read philosophical and literary works from pre-Columbian civilizations, scholastic, and Marxian traditions, as well as engage contemporary thinkers on feminism, race, social movements, and migration.

Cross-Listed as: This is the same course as Phl341 and may be taken only once for credit.

## ChLa 345 - Public Art: Mexican-American/Chicano Muralism (4)

Introduces the historical background of public art and mural creation from the mural movement origins in Mexico to current community mural movements in the United States. Identifies a wide range of mural sty les and trends. Considers practical information, skills, and techniques. Applies this base knowledge to formulate and evaluate a personal approach to mural art in the development of a mural proposal. Create along with the instructor a local mural project and/or public art project.

## ChLa 360 - Bilingualismin U.S. Latinx Communities (4)

Due to the constant contact between English and Sp anish in the U.S., a natural bilingual context flourishes in which new linguistic innovations emerge. Even though these two
languages coexist, the political, economic, and social capital that English represents accords it a dominant status over Spanish. Froman interdis ciplinary perspective, this course critically analyzes Spanish-English bilingualism through sociohistorical, sociopolitical, and sociocultural lenses with the goal of dis mantling monolingual ideologies and empowering speakers of multilingual dis courses.

## ChLa 375U - Southwestern Borderlands (4)

Social, economic, political org anization, and representation of the United States/Mexico borderlands. While conflict characterizes the history of the interactions among border actors, the contemporary period reveals growing interdependence and economic integration. Explores cultural and social formations of Anglo- Americans and Mexican Americans in a dynamic contact zone, as well as the continuities and dis continuities in popular and academic representations of the border experience.

## ChLa 380U- Latinos in the Economy and Politics (4)

Offers an overview of economic and political issues facing Latino communities in the United States, with an emphasis on labor market experience, the causes of poverty, and the role of political and civic organizations in shaping Latino ethnic identity.

## ChLa 390U - Latinos in the Pacific Northwest (4)

Introduction to past and present experiences of Mexicans and other Latin American-origin populations in the U.S. Pacific Northwest. Attention to current population growth, including sources of migration and settlement patterns. Explores the presentsocial, economic, and political status of Latinos in this region of the country.

## ChLa 399-Special Studies (1-8)

See department for course description. (Credit to be arranged.)

## ChLa 399U- Special Studies (4)

(Credit to be arranged.)

## ChLa 401 - Research (1-8)

Consent of instructor. See department for course description. (Credit to be arranged.)

## ChLa 404 - Internship(1-12)

(Credit to be arranged.)

## ChLa 405 - Reading and Conference (1-8)

Consentof instructor. See department for course description. (Credit to be arranged.)

## ChLa 407 -Seminar (1-8)

Consentof instructor. See department for course description. (Credit to be arranged.)

## ChLa 408-Workshop(1-8)

Consent of instructor. See department for course description. (Credit to be arranged.)

## ChLa 410 -SelectedTopics (1-8)

See department for course description. (Credit to be arranged.)

## ChLa 411 - Chicano/Latino History Seminar (4)

This course will take an in-depth look at the history of Chicano/Latino experience in this country examining such is sues as the Treaty of Guadalupe-Hidalgo and its affect on Latinos. Additional topics will include is sues dealing with why the Puerto Rican and Cuban experienceh as been different than for other Latinos in this country. Recommended prerequisite: ChLa 201.

## ChLa 414-Chicano/Latino Literature (4)

Examination of the works created by some of the leading Chicano/Latino novelists, poets, and short fiction writers from the 1960s to present day. The course will look at the impact of their work and how it impacts how Latinos view themselves and their place in American society. Recommended prerequis ite: ChLa 302U.

## ChLa 420-Chicanx Families (4)

Multidisciplinary examination of Chicanxfamilies to explore how Chicanxwriters, scholars, and artists have defined and revised notions of family, kinship, gender, patriarchy, and power.
Prerequisite: Upper division standing.

## ChLa 450U- Latinos in Education (4)

Surveys his torical and contemporary social science research on the factors influencing the educational status of Latinos in the United States. A brief history of the Latino schooling experience serves as an introduction to current is sues such as bilingual education, school segregation, and highereducation access. Special attention is givento educational inequalities among Latinos and to the relationship between schooling and limited class mobility.
Prerequisite: upper-division standing.

## ChLa 471 - ChicanxLabor History in the USA (4)

A study of the development and growth of Chicanx labor movements in the 20th century. The first part of the course will focus on movements prior to 1960, and the second will focus on casestudies of key labor movements after 1960 focused on labor org anizing, community, collective bargaining, and the growing diversity within Latinx working-class communities. Race, class, gender, ethnicity, and immigration status will be discussed.

Also offered for graduate-level credit as Hst 571 and may be taken only once forcredit. Prerequisite: Upper-division standing. Cross-Listed as: This is the same course as Hst 471 and may be taken only once for credit.

## ChLa 507 -Seminar (1-8)

(Credit to be arranged.)

## ChLa 510 -SelectedTopics (1-8)

See department for course description. (Credit to be arranged.)

## Chn - Chinese

## Chn 101 - First-Year Chinese Term 1 (5)

An introduction to Mandarin: listening, speaking, reading, and writing. Characters and spoken language presented concurrently throughout the year. This is the first course in a sequence of three: Chn 101, Chn 102, and Chn 103. For non-native speakers only.

## Chn 102 - First-Year Chinese Term 2 (5)

An introduction to Mandarin: listening, speaking, reading, and writing. Characters and spoken language presented concurrently throughout the year. This is the second course in a sequence of three: Chn 101, Chn 102, and Chn 103. For non-native speakers only.

## Chn 103 - First-Year Chinese Term3 (5)

An introduction to Mandarin: listening, speaking, reading, and writing. Characters and spoken language presented concurrently throughout the year. This is the third course in a sequence of three: Chn 101, Chn 102, and Chn 103. For non-native speakers only.

## Chn 199 - Special Studies (1-12)

(Credit to be arranged.)

## Chn 201 -Second-Year Chinese Term 1 (5)

Continued work in Mandarin, with emphasis on mastering all bas ic grammatical structures, developing conversation skills, and building vocabu lary in characters with correct pronunciation. This is the first course in a sequenceof three: Chn 201, Chn 202, and Chn 203. Expected preparation: Chn 103. For non-native speakers only.

## Chn 202 -Second-Year Chinese Term 2 (5)

Continued work in Mandarin, with emphasis on mastering all basic grammatical structures, developing conversation skills, and building vocabulary in characters with correct pronunciation. This is the second course in a sequence of three: Chn 201, Chn 202, and Chn 203. Expected preparation: Chn 103. For non-native speakers only.

## Chn 203 - Second-Year Chinese Term3 (5)

Continued work in Mandarin, with emphasis on mastering all basic grammatical structures, developing conversation skills, and building vocabulary in characters with correct pronunciation. This is the third course in a sequence of three: Chn 201, Chn 202, and Chn 203. Expected preparation: Chn 103. For non-native speakers only.

## Chn 299 - Special Studies (1-12)

(Credit to be arranged.)

## Chn 301 - Third-Year Chinese Term 1 (4)

Intermediate conversation, reading, writing, vocabulary building, and grammar. Introduction to literary and expository texts. This is the first course in a sequence of three: Chn 301, Chn 302, and Chn 303. Expected preparation: Chn 203. For non-native speakers only.

## Chn 302 - Third-Year Chinese Term 2 (4)

Intermediate conversation, reading, writing, vocabulary building, and grammar. Introduction to literary and expository texts. This is the second course in a sequence of three: Chn 301, Chn 302, and Chn 303. Expected preparation: Chn 203. For non-native speakers only.

## Chn 303 - Third-Year Chinese Term 3 (4)

Intermediate conversation, reading, writing, vocabulary building, and grammar. Introduction to literary and expository texts. This is the third course in a sequence of three: Chn 301, Chn 302, and Chn 303. Expected preparation: Chn 203. For non-native speakers only.

## Chn 304 - Chinese News paper Readings (4)

Practical introduction to the reading and accurate understanding of Chinese newspapers and related specialized styles of writing. Recommended as a complement to third-year Chinese. Expected preparation: Chn 303. For non-native speakers only.

## Chn 306 - Business Chinese (4)

Practice in oral and written Chinese at the upperintermediate level, with emphas is on business vocabulary and procedures. Recommended as a complement to thirdyearChinese. Expected preparation: Chn 203; Chn 303, Chn 304. For non-native speakers only.

## Chn 311 - Introductory Classical Chinese (4)

Readings in the traditional literary language, designed to provide familiarity with essential particles and structures, build vocabulary, and introduce works fromall genres and periods.Recommended as a complement to third-year Chinese; preparation for advanced work in either modern or classical Chinese. This is the first course in a sequence of two: Chn 311 and Chn 312. Expected preparation: Chn 203. For non-native speakers only.

## Chn 312 - Introductory Classical Chinese (4)

Readings in the traditional literary language, designed to provide familiarity with essential particles and structures, build vocabulary, and introduce works fromall genres and periods.Recommended as a complement to third-year Chinese; preparation for advanced work in either modern or classical Chinese. This is the second course in a sequence of two: Chn 311 and Chn 312. Expected preparation: Chn 203. For non-native speakers only.

Chn 341U- Topics in Chinese Literature and Thought: Service and Retreat (4)

Interdisciplinary readings from the core of the written tradition, including history, poetry, classical anecdotes and essays, related to the central issues facing the Chinese elite throughout his tory: whether, how, and under what conditions to serve the state. Conducted in English.

## Chn 342U- Chinese Vernacular Literature (4)

342 emphasizes traditional poetry and fiction from 700 BC to the late nineteenth century; 343 emphas izes influential works of the twentieth century, fromsemi-traditional to avant-garde. This is the first course in a sequence of two: Chn 342 and Chn 343. Conducted in English.

## Chn 343U- Chinese Vernacular Literature (4)

342 emphas izes traditional poetry and fiction from 700 BC to the late nineteenth century; 343 emphas izes influential works of the twentieth century, fromsemi-traditional to avant-garde. This is the second course in a sequence of two: Chn 342 and Chn 343. Conducted in English.

## Chn 399 - Special Studies (1-6)

(Credit to be arranged.)

Chn 404 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

## Chn 405 - Reading and Conference (1-8)

(Credit to be arranged.)

## Chn 408 - Workshop(1-8)

(Credit to be arranged.)

Chn 409 - Practicum (1-12)
(Credit to be arranged.)

## Chn 410 -SelectedTopics (1-6)

(Credit to be arranged.)

## Chn 411 - Advanced Chinese (4)

Development of facility with complex patterns in conversation, reading and writing. Topics such as Rural China, The Philosophers, Documentary Chinese, The Structure of Chinese. This is the first course in a sequence of two: Chn 411 and Chn 412. Expected preparation: Chn 303; Chn 304, Chn 311, Chn 312. For non-native speakers only.
Also offered for graduate-level credit as Chn 511 and may be taken only once forcredit. .

## Chn 412 - Advanced Chinese (4)

Development of facility with complex patterns in conversation, reading and writing. Topics such as Rural China, The Philosophers, Documentary Chinese, The Structure of Chinese. This is the second course in a sequence of two: Chn 411 and Chn 412. Expected preparation: Chn 303; Chn 304, Chn 311, Chn 312. For non-native speakers only.

Also offered for graduate-level credit as Chn 512 and may be taken only once for credit. .

## Chn 413 - Advanced Classical Chinese (4)

Readings fromclassical works of various genres and his torical periods, designed to solidify the structures introduced in Chn 311 and 312, build further vocabulary and introduce the fundamentals of clas sical Chinese literary history. Expected preparation: extensive third-year coursework in Chinese, preferably including Chn 311 and Chn 312. For non-native speakers only.

Also offered for graduate-level credit as Chn 513 and may be taken only once for credit. .

## Chn 420 - Readings in Chinese Literature (4)

Reading, analysis, and discussion of representative literary texts. Chn 420 focuses on pre-modern topics such as
"Traditional Chinese Fiction" and "Chinese Clas sical Masterpieces," while Chn 421 addresses primarily twentieth-century topics such as "ChineseNativist Literature" or "Chinese Urban Literature." This is the first course in a sequenceoftwo: Chn 420 and Chn 421. Expected preparation: Chn 303; Chn 304, Chn 311, Chn 312. For non-native speakers only.

Also offered for graduate-level credit as Chn 520 and may be taken only once for credit. .

## Chn 421 - Readings in Chinese Literature (4)

Reading, analysis, and discussion of representative literary texts. Chn 420 focuses on pre-modern topics such as "Traditional Chinese Fiction" and "Chinese Classical Masterpieces," while Chn 421 addresses primarily twentieth-century topics such as "ChineseNativist Literature" or "Chinese Urban Literature." This is the second course in a sequence of two: Chn 420 and Chn 421.

Expected preparation: Chn 303; Chn 304, Chn 311, Chn 312. For non-native speakers only.

Als o offered for graduate-level credit as Chn 521 and may be taken only once for credit. .

## Chn 490 - History of the Chinese Language (4)

History of the Chinese language and language family, with emphas is on the development of the current standard language. Evolution of phonology, morphology, and syntax in spoken Chinese, development of the Chinese writing system, history of Chinese lexicography, and current language policy. Conducted in English. Expected preparation: at least one course in linguistics (Ling 290 or above), or proficiency in Chinese equivalent to Chn 203.
Also offered for graduate-level credit as Chn 590 and may be taken only once for credit. .

Chn 505 - Reading and Conference (1-8)
(Credit to be arranged.)

## Chn 509 - Practicum (1-12)

(Credit to be arranged.)

## Chn 510 -SelectedStudies (1-6)

(Credit to be arranged.)

## Chn 511 - Advanced Chinese (4)

Development of facility with complex patterns in conversation, reading and writing. Topics such as Rural China, The Philosophers, Documentary Chinese, The Structure of Chinese. This is the first course in a sequence of two: Chn 511 and Chn 512. Expected preparation: Chn 303; Chn 304, Chn 311, Chn 312.

Also offered for undergraduate-level credit as Chn 411 and may be taken only once for credit. .

## Chn 512 - Advanced Chinese (4)

Development of facility with complex patterns in conversation, reading and writing. Topics such as Rural China, The Philosophers, Documentary Chinese, The Structure of Chinese. This is the second course in a sequence of two: Chn 511 and Chn 512. Expected preparation: Chn 303; Chn 304, Chn 311, Chn 312.
Also offered for undergraduate-level credit as Chn 412 and may be taken only once for credit. .

## Chn 513 - Advanced Classical Chinese (4)

Readings fromclassical works of various genres and historical periods, designed to solidify the structures introduced in Chn 311 and 312, build further vocabulary
and introduce the fundamentals of clas sical Chinese literary history. Expected preparation: extensive third-year cours ework in Chinese, preferably including Chn 311 and Chn 312.
Also offered for undergraduate-levelcredit as Chn 413 and may be taken only once for credit. .

## Chn 520 - Readings in Chinese Literature (4)

Reading, analysis, and discussion of representative literary texts. Chn 420 focuses on pre-modern topics such as "Traditional Chinese Fiction" and "Chinese Classical Masterpieces," while Chn 421 addresses primarily twentieth-century topics such as "Chinese Nativist Literature" or "Chinese Urban Literature." This is the first course in a sequenceof two: Chn 520 and Chn 521. Expected preparation: Chn 303; Chn 304, Chn 311, Chn 312.

Also offered for undergraduate-levelcredit as Chn 420 and may be taken only once for credit. .

## Chn 521 - Readings in Chinese Literature (4)

Reading, analysis, and discussion of representative literary texts. Chn 420 focuses on pre-modern topics such as "Traditional Chinese Fiction" and "Chinese Clas sical Masterpieces," while Chn 421 addresses primarily twentieth-century topics such as "ChineseNativist Literature" or "Chinese Urban Literature." This is the second course in a sequence of two: Chn 520 and Chn 521. Expected preparation: Chn 303; Chn 304, Chn 311, Chn 312.

Also offered for undergraduate-levelcredit as Chn 421 and may be taken only once for credit. .

## Chn 590 - History of the Chinese Language (4)

History of the Chinese language and language family, with emphasis on the development of the current standard language. Evolution of phonology, morphology, and syntax in spoken Chinese, development of the Chinese writing system, history of Chinese lexicography, and current language policy. Conducted in English. Expected preparation: at least one course in linguistics (Ling 290 or above), or proficiency in Chinese equivalentto Chn 203.

Also offered for undergraduate-level credit as Chn 490 and may be taken only once for credit. .

## Cl - Curriculum \& Instruction

CI 199 - Special Studies (1-3)
(Credit to be arranged.)

## CI 251 - Introduction to Early Childhood Education (3)

This course will provide an overview of the early childhoodeducation profession, including issues, research,
historical influences, programs for young children, and career options. Field experience required.

## CI 252 - Instruction and Management in Preschool Education (3)

Growth and development characteristics of preschool children (ages 3-5) for planning educational programs, curriculum, instruction, scheduling, and environment, management, and parent communication. Field experience required. Recommended prerequisite: CI 251 or cours ework in human growth and development.

## CI 253 - Preschool Programming (3)

This course will provide experienceand guidance in planning, implementing and evaluating developmentally appropriate teaching and learning experiences in preschool settings. Field experience required. Recommended prerequisite: CI 252.

## CI 350 - Aes thetics and Physical Education for Young Children (4)

This course will provide preparation for planning, implementing, and evaluating developmentally appropriate integrated teaching and learning experiences in art, music, movement, drama, and physicaleducation for young learners, ages 4-8 years. Recommended prerequisites: admis sion to teacher education; CI 251.

## CI 351 -Science, Social Studies andHealth for Young Children (5)

This course will provide preparation for planning, implementing, and evaluating developmentally appropriate integrated teaching and learning experiences in science, social studies, and health for young learners, ages 4-8 years. Recommended prerequisites: admis sion to teacher education; CI 251.

## CI 401 - Research (1-6)

(Credit to be arranged.) Consent of instructor.

CI 402 - Independent Study (1-3)
(Credit to be arranged.)

## CI 403 - Thesis (1-6)

(Credit to be arranged.)

CI 404 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

## CI 405 - Reading and Conference (1-6)

(Credit to be arranged.) Consent of instructor.

## CI 406 -Special Problems (1-6)

(Credit to be arranged.)

## CI 407 - Seminar (1-6)

(Credit to be arranged.)

## CI 408 - Workshop(1-8)

(Credit to be arranged.)

## CI 409 - Practicum(1-15)

(Credit to be arranged.) Consent of instructor.

## CI 410 - Experimental Course (1-12)

(Credit to be arranged.)

## CI 432 - Computer Applications for the Classroom (3)

This course is designed for pre-serviceorin-service teachers who wish to become comfortable with the use of the computer to enhance classroomteaching and learning. Topics include an introduction to computers and technology in education; review and curriculumintegration of courseware; use of word processing; designing and using computer-based databases in the classroom; computer literacy; and graphics software for the clas sroom.

Also offered for graduate-level credit as CI 532 and may be taken only onceforcredit.

## CI 433 - Computer Applications in Instruction (3)

A comprehensive survey of the use of microcomputers in instruction. Terminology, educational applications, ethical is sues, courseware, evaluation and selection, multimedia applications, management tools foreducators, planning and organizing for school computer use, hardware selection, computer literacy and technological literacy, and network res ources forteachers. Hands-on use of the computer to review courseware is an important part of the course. Expected preparation: CI 432 orequivalent.

Also offered for graduate-levelcredit as CI 533 and may be taken only once for credit. .

## CI 434 - Microcomputer-based Management and

 Research Tools for Educators (3)This course introduces educators to important and useful tools for clas sroom, personal, and professional use: word processing, database, spreadsheet, survey, and statistical applications. Each class session includes demonstration and hands-on use of microcomputers. Each student will develop a word-processed document, a database, a spreadsheet application, a survey, and a statistical document. Expected preparation: CI 432 or equivalent.
Cross-Listed as: Also offered for graduate-level credit as CI 534 and may be taken only once for credit. .
CI 443 - Effective Tchg Strategies \& Materials for Working with Linguistically \& Culturally Diverse Stdnts (3)
What strategies and materials work in teaching children who are learning English? Become acquainted with the current research on identification, development, and practice of developmentally and linguistically appropriate strategies and materials to effectively engage English Language Learners (ELL) at all grade levels in the learning process. Special attention will be given to students' bilingual/bicultural characteristics as important aspects of developing successful curriculum.
Also offered for graduate-level credit as CI 543 and may be taken only once for credit.

## CI 455 - LGBTQ Advocacy In PRE-K-12 Classrooms (1-2)

Provides students with knowledge and skills to facilitate increased understanding of others and self around is sues of identity, context, sexual orientation, and gender. Using cons tructivist approaches, participants develop a personal framework for encountering and making sense of gender and sexual identity as they manifest in PRE-K-12 schools.

Also offered for graduate-level credit as CI 555 and may be taken only once for credit. . Prerequisite: upper-division standing.

## CI 491 - Enriching Children's Reading (3)

A study of the enrichment of children's reading through literature. An advanced course designed for parents and teachers of nursery, kindergarten, and elementary school children. Expected preparation: Lib 428/528.

## CI 496 -Second Language Acquisition and Development for K-12 Educators (3)

Gain historical pers pectives on language teaching. Study major concepts, theories, res earch and variables related to
the nature and acquisition of language. Consider individual differences and patterns common to all learners .
Collect/analyze natural language fromlanguage learners. Construct environments that support ESOL/bilingual students' language/literacy development and content-area achievement.

Also offered for graduate-level credit as CI 596 and may be taken only once for credit. . Prerequisite: Admis sion into the Secondary Graduate Teacher Education Program (GTEP), the Secondary Dual Endorsement Program (SDEP), or the Bilingual Teacher Pathway (BTP) Program.

CI 497 - Assessment of Language and Content Learning for K-12 English Learners (2)
Consider fair, accurate, and meaningful as sessment for English learners. Learn aboutcommon standards-based as sessment instruments. Examine differences between and uses for as sessments measuring language proficiency and content area achievement as they affect ESOL and bilingual student learning. Explore is sues in clas sroombased assessment of ELLs.

Also offered for graduate-level credit as CI597 and may be taken only once for credit. . Prerequisite: Admis sion into the Secondary Graduate Teacher Education Program (GTEP), the Secondary Dual Endorsement Program (SDEP), or the Bilingual Teacher Pathway (BTP) Program.

## CI 501 - Research (1-9)

(Credit to be arranged.) Consent of instructor.

CI 502 - Independent Study (1-12)
(Credit to be arranged.)

## CI 503 - Thesis (1-9)

(Credit to be arranged.)

## CI 504 - Cooperative Education/Internship (1-9)

(Credit to be arranged.)

## CI 505 - Reading and Conference (1-15)

(Credit to be arranged.) Consent of instructor.

## CI 506 -Special Problems (1-6)

(Credit to be arranged.)

## CI 507 - Seminar (1-6)

(Credit to be arranged.)

CI 508 - Workshop(1-8)
(Credit to be arranged.)

## CI 509 - Practicum: Reading Endorsement (1-9)

Practicumrequires reading endorsement candidates to work directly with students. Candidates will enact the various responsibilities of a reading specialist/literacy coach, to include: assessing and instructing a strug gling reader, developing curriculumfor various groups of readers, assessing and making recommendations for individual teachers or for a school's reading program, developing literacy-focused professional development sessions for instructional assistants, and communicating with parents and community members.

## CI 510 - Experimental Course (1-15)

(Credit to be arranged.)

## CI 511 - Examining Base Ten Numeration and Operations (3)

Explore the base ten structure of the number systemand how that structure is used in multi-digit computation. Investigate how basic concepts of whole numbers reappear when working with decimals. Student thinking is at the center of this course through examination of student work and students at work.

## CI 512 - Examining Operations with Whole Numbers and Fractions (3)

Examine the actions and situations modeled by the four bas ic operations. Begin with a view of how counting moves toward solving whole number problems and then how whole number operations extend to the context of fractions. Student thinking is at the center of this course throughexamination of student work.

## CI 513 - Enhancing Algebraic Thinking: Generalization about Operations (3)

Examine generalizations at the heart of studying operations in the elementary grades. Expres s generalizations in common language and algebraically, develop representation-based arguments, study what it means to prove, and extend generalizations fromwhole numbers to
integers. Student thinking is at the center of this course through examination of student work.

## CI 514-Enhancing Algebraic Thinking:Patterns and Functions (3)

Discoverhow patterns lead tofunctions, learn to read tables and graphs to interpret change, and use algebraic notation to write rules. Withemphasis on linear functions, explore nonlinear functions, examine how function features are seen in graphs, tables, or rules. Student thinking is at the center of this course.

## CI 515 -Developing Geometric Thinking and Concepts (3)

Examine aspects of two- and three-dimensional shapes, develop geometric vocabulary, and explore both definitions and properties of geometric objects. Study angle, similarity, congruence, and the relationships between 3-D objects and their 2-D representations. Student thinking is at the center of this course throughexamination of student work.

## CI 516-Exploring Measurement Concepts (3)

Examine different attributes of size, develop facility in composing and decomposing shapes, and apply these skills to make sense of area and volume formulas. Explore conceptual is sues of length, area, and volume, as well as inter-relationships. Student thinking is at the center of this course through examination of student work.

## CI 517 -Developing Concepts of Data Analysis (3)

Focus attention on datarepresentation, analysis, and how students' ideas develop over time. Work with collection, representation, and interpretation of data. Learn what various graphs and statistical measures show about data, study how to summarize data when comparing groups, and consider whether data provide insight into questions inspiring data collection.

## CI 518 -Mathematics Teacher Leadership: Implementing Effective and Equitable Mathematics Teaching Practices (3)

Examine research-informed effective and equitable mathematics teaching practices, strategies for their implementation, and the ways they show up in curriculum materials. Deconstruct instructional practice and consider the ways learning environments and decisions abouttasks, tools, and talk influenceengagement, understanding, and identity development. Includes 30 -hour practicum.

## CI 519 -Mathematics Teacher Leadership: Supporting Collegial Learning and School Improvement (3)

Develop an understanding of the role of and the challenges faced by mathematics instructional leaders. Examine leadership practice and consider the varied ways leaders work-advocate, collaborator, co-teacher, mentor, facilitator-each contributing to collegial learning and ongoing improvement in the school mathematics program. Includes 30-hour practicum.

## CI 520 -Linguistics for Teachers (3)

What should classroomteachers know about language and how it works? This course will give teachers background knowledge about the sounds, grammar, meaning system, and social context of language and the implications these have for class roompractice in reading, writing, and speaking. Addresses topics such as invented spelling, the role of phonics in reading, the teaching of grammar, and Black English and other linguis tic variations.

## CI 521 -Mathematics Teacher Leadership: Responsive Mathematics Instruction and Assessment (1-3)

Examine assets-based approaches to instruction and assessment that center on student thinking and reasoning. Consider ways responsive mathematics pedagogies attend to the strengths and needs of diverse learners. Analyze assessment practice and consider what it means to as sess and provide feedback that activates students as owners of their learning. Includes 30 -hour practicum. This course is repeatable for a maximum of 3 credits.

## CI 523 -Language Arts in Middle Schools (4)

Designed forteachers at the middle school level. Explores the nature of teaching young adolescents, including developmental psychology and methods of literacy education with a corresponding field experience. Includes ways of studying language through literature and the arts, us ing writing and speaking to study language, language use in different academic settings and content areas, and emerging trends for studying language in the 21st century.

## CI 524-Writing Workshop(3)

Primary focus is on establishing writing workshops in the elementary/secondary classrooms. Approach guides educators through all phases of establishing a writing works hop atmo sphere. Inclusion of state writing standards and peerediting procedures as well as integrating writing across the curriculumare included.

## CI 525 - Issues and Perspectives in the Teaching of Reading (3)

An examination of the development of current practices in the teaching of reading. The identification of major trends and is sues and a critical review of relevant past and present research.

Prerequisite: completion of student teaching.

## CI 526 - Reading for the Creative and Gifted (3)

A study of the unique reading characteristics of the creative and gifted and an overview of psychological and philosophical understandings important for the teacher teaching reading to these able students.
Prerequisite: Lib 428/528.
CI 528 - Literacy Assessment for Reading Specialists (3)

This course focuses on the purposes for literacy as sessment, ty pes of assessments, the impact of culture and languageon assessment, and the fundamental link between literacy as sessment and instruction. Topics include the purposes of literacy assessment tools, the selection of as sessments that informinstruction and as sessments that inform various stakeholders, the development of a schoolwide assessment program, and an analysis of current as sessment practices. The course is designed to develop a more extensive understanding of assessment as it relates to evidence-based literacy instruction, diversity issues, and students' literacy development.

## CI 529 - School Reading ProgramLeadership (3)

The course is for current or future administrators, coordinators, curriculumconsultants, or teachers whose responsibilities will include leadership roles in the administration of school-wide or dis trict-wide reading programs. It deals with long-and short-termobjectives, school organizational patterns, staff competencies, materials selection, programevaluation, needs assessment, and the use of community resources.
Prerequisite: CI474/574 or equivalent.

## CI 530 - Teaching Struggling Adolescent Readers (3)

Designed to help teachers to develop an understanding of adolescent readers within school settings, to expand their teaching repertoire, to assist strugg ling readers, and to org anize plans that improvesecondary literacy programs. Appropriate for classroomteachers, reading specialists, and administrators interested in adolescent literacy.

## CI 531 - Facilitating Content Area Literacy Strategies

 (3)Course designed to help literacy leaders to facilitate content area literacy strategies in elementary, middle, and high schools and to guide students in acquiring skills needed for adequate reading, thinking, writing, and study in the disciplines. Emphasis will be on collaborating with teachers in a leadership role to facilitate strategies in all school subjects.

## CI 532 - Computer Applications for the Classroom (3)

This course is designed for pre-serviceor in-service teachers who wish to become comfortable with the use of the computer to enhance classroomteaching and learning. Topics include an introduction to computers and technology in education; review and curriculumintegration of cours eware; use of word processing; designing and using computer-based databases in the clas sroom; computer literacy; and graphics software for the classroom.

Also offered for undergraduate-level credit as CI432 and may be taken only once for credit.

## CI 533 - Computer Applications in Instruction (3)

A comprehensive survey of the use of microcomputers in instruction. Terminology, educational applications, ethical is sues, courseware, evaluation and selection, multimedia applications, management tools for educators, planning and org anizing for school computer use, hardware selection, computer literacy and technological literacy, and network res ources for teachers. Hands-on use of the computer to review courseware is an important part of the course. Expected preparation: CI 432 orequivalent.

Also offered for undergraduate-level credit as CI433 and may be taken only once for credit. .

## CI 534-Microcomputer-based Management and Research Tools for Educators (3)

This course introduces educators to important and useful tools forclas sroom, pers onal, and professional use: word processing, database, s preadsheet, survey, and statistical applications. Each class session includes demonstration and hands-onuse of microcomputers. Each student will develop a word-processed document, a database, a spreadsheet application, a survey, and a statistical document. Expected preparation: CI432 or equivalent.
Also offered for undergraduate-level credit as CI434 and may be taken only once for credit. .

## CI 536 - Language, Literacy, and Culture (3)

Understanding the central importance of language as it functions within educational contexts. Implications of social, cultural, and linguistic diversity on teaching and learning.

## CI 540 - Modeling with and Using Representations in Mathematics (3)

Examine the role of modeling and representing in mathematics learning and teaching. Investigate ways in which teachers and students use representations and translations across representations in support of mathematics teaching and learning. Finally, consider how using representations support equitable teaching.

## CI 541 - Reasoning and Proving Across Mathematics

 (3)Examine the role of reas oning and proving across the mathematical domains. Investigate student conceptions of proof and the appropriate curriculumtreatment of topics related to conjecturing, justifying, and generalizing. Design instructional and assessment tasks that elicit student thinking and formulate ways to move student thinking forward in mathematically productive ways.

## CI 543 - Effective Tchg Strategies \& Materials for Working with Linguistically \& Culturally Diverse Stdnts (3)

What strategies and materials work in teaching children who are learning English? Become acquainted with the current research on identification, development, and practice of developmentally and linguistically appropriate strategies and materials to effectively engage English Language Learners (ELL) at all grade levels in the learning process. Special attention will be given to students' bilingual/bicultural characteristics as important aspects of developing successful curriculum.

Also offered for undergraduate-levelcredit as CI 443 and may be taken only once for credit.

## CI 545 - Educating Early Adolescents (3)

Focuses on the nature of early adolescence and examines theory and practice informing development of the philosophy of early adolescenteducation, organizational structures appropriate for these learners, and the diverse roles of the middle-level teacher. Introduces students to the curriculumand delivery methods appropriate for emerging adolescents.

## CI 547 - Advanced Elementary Literacy Methods (3)

Concentrated study of recent trends and recurring problems in selecting, organizing, evaluating, and presenting concepts, information, and materials of instruction in subjects taught in elementary school: art, health, language arts, mathematics, music, physical education, reading
(includes one additional field work credit), science, social studies.

## CI 550 - Teacher Leadership (3)

Teacher Leadership is a course for educators, particularly K-12 teachers, curriculum developers, mentors, coaches, and other leaders, who would like to learn more about how to be effective leaders in their school agencies. There is a focus on successfully meeting the needs of a diverse student population and promoting equity and social justice.

## CI 555-LGBTQ Advocacy In PRE-K-12 Classrooms (1-2)

Provides students with knowledge and skills to facilitate increased understanding of others and self around is sues of identity, context, sexual orientation, and gender. Using constructivist approaches, participants develop a pers onal framework for encountering and making sense of gender and sexual identity as they manifest in PRE-K-12 schools.

Also offered for undergraduate-level credit as CI455 and may be taken only once for credit. . Prerequisite: upperdivision standing.

## CI 561 - Advanced Educational Psychology (3)

Review and development of modern viewpoints in educational psychology with particular attention to theories of learning and their application to school and educational problems; an examination of experimental material that seems most useful and relevant to educational psychology.

## CI 565 - Theoretical Models of Curriculum (3)

Study of the history of curriculumand curriculum theory in the United States. Emphasis is placed on the historical, philosophical, and scientific foundations of curriculum theory. A main goal of the course is to provide a framework for evaluation, selection, and development of school curricula.

Also offered as CI 665 and may be taken only once for credit.

## CI 566-Curriculum Construction (3)

Evaluation of current curricular programs and trends. Techniques and methods of curricular improvement. Leadership in curricular improvement. Preparation of a curriculum.

## CI 567 - Curriculum and Culture (3)

Understanding the cultural basis of instructional materials in curriculumdevelopment and teaching and how the
organization of knowledge in a subject area and the explanation of new ideas are influenced by cultural root metaphors. Planning and administering the instructional materials center in the modern school. The cooperative roles of the teacher, administrator, and librarian in curricular development and materials.

## CI 568 - The Curriculum of the Public School (3)

Overview of the public school curriculumwith emphasis on the various subject fields; organization of the school for curriculumdevelopment; education objectives; the course of study; evaluation of the public school curriculum.

## CI 570 - Child Development and Education (3)

In-depth study of child development theory, principles, current research, practice of observational strategies, and application of growth and development data to educational programs for young children. Study will extend to decision making and developmentally appropriate practice in early childhoodeducation.
Prerequisite: Undergraduate early childhood education coursework or teaching experience with young children.

## CI 574 - Assessing and Teaching Struggling Eementary

 Readers (3)This course focuses on working with elementary students experiencing difficulties in learning to read. It deals with theoretically-based understanding and analysis of students' reading; developing students reading knowledge and strategies; social and psychological aspects of literacy problems. The course includes a field experience in the form of a case study of a struggling reader. Students are res ponsible for arranging to work with a struggling reader in a school or other setting once or twice a week throughout thequarter.

## CI 580 - Theories of Instruction (3)

An investigation of what happens in the classroom, emphasizing the interrelatedness of learning, subject matter, and teaching; testing of scholars' and the students' own ideas against concretecase studies of instruction; formulation and defense of one's own theory.
Prerequisite: teaching experience or consent of instructor.

## CI 581 - Issues in Education (3)

An introduction to the study of contemporary issues which impact teaching and learning environments for K-12 students and their teachers. This course is a graduate seminar in which students will identify critical is sues in contemporary education and analyze those is sues froma variety of pers pectives.

Also offered as CI 681 and may be taken only once for credit.

## CI 590 - Action Research Proposal (3)

Designed to help educators see themselves as researchers so that they can conduct research in educational settings that contribute to the improvement of education. Knowledge of accessing and using research literature, the range of educational research paradigms and using appropriate research methods included. Students will develop a proposal for an action research project related to improving educational outcomes for all learners.

## CI 591 - Action Research Implementation (3)

Implementation of action res earch project designed in ECED 590. Discuss is sues related to implementation of action research project designed in ECED 590. Learn skills to analyze data collected during implementation of action research proposal fromsurveys, interviews, focus groups, observation, journaling, writing and concept maps. Develop critical thinking abilities to analyze, synthesize and evaluate research results. Present final project in written paper.

Prerequisite: CI 590.

## CI 596 -Second Language Acquisition and Development for K-12 Educators (3)

Gain historical pers pectives on language teaching. Study major concepts, theories, res earch and variables related to the nature and acquisition of language. Consider individual differences and patterns common to all learners. Collect/analyze natural language fromlanguage learners. Construct environments that support ESOL/bilingual students' language/literacy development and content-area achievement.
Also offered for undergraduate-level credit as CI496 and may be taken only once for credit. . Prerequisite: Admission into the Secondary Graduate Teacher Education Program(GTEP), the Secondary Dual Endorsement Program(SDEP), or the Bilingual Teacher Pathway (BTP) Program.

## CI 597 - Assessment of Language and Content Learning for K-12 English Learners (2)

Consider fair, accurate, and meaningful as sessment for English learners. Learn about common standards-based as sessment instruments. Examine differences between and uses for assessments meas uring language proficiency and content area achievement as they affect ESOL and bilingual student learning. Explore is sues in clas sroombased assessment of ELLs.

Also offered for undergraduate-level credit as CI497 and may be taken only once for credit. . Prerequis ite:
Admission into theSecondary Graduate Teacher Education

Program(GTEP), the Secondary DualEndorsement Program(SDEP), or the BilingualTeacher Pathway (BTP) Program.

## CI 601 - Research (1-9)

(Credit to be arranged.)

CI 602 - Independent Study (1-9)
(Credit to be arranged.)

CI 603 - Dissertation (1-16)
(Credit to be arranged.)

## CI 604 - Cooperative Education/Internship (1-9)

(Credit to be arranged.)

CI 605 - Reading and Conference (1-9)
(Credit to be arranged.)

CI 606 -Special Problems/Projects (1-9)
(Credit to be arranged.)

CI 607 - Seminar (1-9)
(Credit to be arranged.)

## CI 608 - Workshop(1-9)

(Credit to be arranged.)

CI 609 - Practicum (1-9)
(Credit to be arranged.)

## CI 610 -Selected Topics (1-9)

(Credit to be arranged.)

## CI 665 - Theoretical Models of Curriculum (3)

Study of the his tory of curriculumand curriculum theory in the United States. Emphasis is placed on the historical, philosophical, and scientific foundations of curriculum theory. A main goal of the course is to provide a framework for evaluation, selection, and development of school curricula.

Also offered as CI 565 and may be taken only once for credit.

## CI 681 - Issues in Education (3)

An introduction to the study of contemporary is sues which impact teaching and learning environments for K-12 students and their teachers. This course is a graduate seminar in which students will identify critical is sues in contemporary education and analyze those is sues froma variety of pers pectives.
Also offered as CI 581 and may be taken only once for credit.

## CI 801 - Research (0-9)

(Credit to be arranged.)

CI 802 - Independent Study (0-9)
(Credit to be arranged.)

## CI 804 - Cooperative Education/Internship (0-12)

(Credit to be arranged.)

CI 805 - Reading and Conference (0-9)
(Credit to be arranged.)

CI 806 - Special Problems (0-9)
(Credit to be arranged.)

CI 807 -Seminar (0-9)
(Credit to be arranged.)

CI 808 - Workshop(0-9)
(Credit to be arranged.)

CI 809 - Practicum (0-9)
(Credit to be arranged.)

CI 810 - Experimental Course (0-12)
(Credit to be arranged.)

## Comm - Communication

## Comm 100 - Introduction to Communication (4)

Overview of major topic areas in communication, including models of communication, social uses of language, communication codes - verbal/ nonverbal, listening and communication in interpersonal, group, intercultural, public, and mass media contexts. Application of theory through skills development and community focused assessments.

## Comm 199 - Special Studies (1-4)

See department for course description. (Credit to be arranged.)

## Comm 215 - Introduction to Intercultural Communication (4)

Designed to give a theoretical understanding of the process and role of communication (both mass and interpersonal) when faced with cultural differences and plurality. Provides a background of classical theories in intercultural communication, and in interdisciplinary areas (cultural studies, gender studies, cultural anthropology, political science, and international development) where culture and communication have been theorized. Discussions will focus on the changing cultural terrain in the United States and upon internationalization and globalization of mass or popular culture as it impacts other parts of the world.

## Comm 218 - Interpersonal Communication (4)

Study of communication concepts, processes, and practices in interpers onal contexts with application of principles and concepts to actual interpersonal communication situations. Includes situational management and behavioral repertoire development, verbal/nonverbal code features structuring conversation and relationships, characteristics of functional relational systems, intercultural/inter-ethnic factors.

## Comm 220 - Public Speaking (4)

Research, writing, delivery, and listening skills for oral presentation in a variety of settings, including multicultural. Equalconsideration given to speech preparation and delivery with critical thinking, argument forms, and audience analysis emphasized. Is sues of speech anxiety addressed.

## Comm 227 - Nonverbal Communication (4)

The study of nonverbal communication as related to verbal communication. Course emphasis on theories and
typologies of nonverbal behavior. Examination of the influence of such factors as para-language, body movement, eye behavior, touch space, time, and physical and socialenvironments. Course requirements include completion and report of a pers onal research project.

## Comm 299 - Special Studies (1-6)

(Credit to be arranged.)

## Comm 300 - Principles of Communication (4)

Introduces the skills and concepts students need for literacy in communication and provides a broad introduction to the perspectives on communication that will be encountered in upper-division Communication courses.

## Comm 311 - Research Methods in Communication (4)

Introduction to the assumptions and methods of research in the study of human communication. Students will learn to design and conduct practical research projects and improve their ability to understand, evaluate, and use reports of research and scholarship encountered in future coursework and in everyday life.

Prerequisite: Comm300.

## Comm 312U - Media Literacy (4)

Focuses on building critical skills forevaluating mass media, going beyond the ways that mes sages represent the world to the ways that mes sages and the institutions that produce themactually constitute the social world. Primary is sues include cultural domination and empowerment; public opinion and the legitimizing role of the media; mass culture and ideology; cultural opposition; the politicaleconomy of news media; and the general role of media in political socialization. Extensive in-class and small-group media analysis.

## Comm 313U - Communication in Groups (4)

Focuses on communication processes in small, decisionmaking groups. Students examine the relation between actual communicative behaviors of group members and group structure, functions, and outcomes. Topics include leadership emergence and enactment, quality of problem solving strategies utilized, the impact of socio-cultural and institutional features on small group communicative practices. Theoretical application in the critical analysis of various group settings and effective communication in ongoing group projects.

## Comm 314U- Persuasion (4)

A consideration of concepts, principles, and theories related to persuasion, and a consideration of the role of persuasive communication in public discourse. Opportunity for practical application of principles in student projects. Sp 100 or Sp 220 recommended.

## Comm 316 - Communication, Individuals, and Discourse (4)

Extends the discussion of empirical approaches to communication introduced in Comm 300. Introduces relevant social science theories of communication including theories based on cognitive and social psychological approaches that depict communication as a process. Comm 316 is a requirement for the major and a recommended prerequisite for 400 -level communication courses.

Prerequisite: Comm 300.

## Comm 317U- Communicating About Violence and Children (4)

Investigation of endangered and violated children in environments including domestic and global. Threats to children's safety, survival, quality of life, family or alternative care, education, health and health care, and basic human rights are examined. Trends in public awareness, information systems, organizational advocacy and intervention efforts are assessed for impact and effectiveness. Students will employ specific listening and speaking practices to promote substantive class discussions. Areas of violence investigated include: physical, sexual and verbal abuse; child soldiers; slavery; war; starvation, disease and dis placement; teaching hatred; religion used as a weapon; cyber-s talking and bullying.

## Comm 318U - Family Communication (4)

Focuses on the study of families from a communication perspective; that is, how families create, maintain and reinforce patterns of interaction through daily living, storytelling and other habitual forms of communication. Course applies theoretical frameworks such as family systems theory, social construction theory and dialectical theory to is sues of courtship and relational development, the changes in the life of families, and family roles.

## Comm 319-Social Media (4)

This course provides students with a deeper understanding of social media and its role in identity/personality, close and less close relationships, and societal change.

Comm 320-Introduction to Political Communication (4)

Communication activities relating directly to the election of candidates and the passage of initiatives. Presented through the context of deliberative democracy and the First Amendment to the U.S. Constitution, which provides a set of "political rules of the road" for democratic processes.

## Comm 321 - Communication in the Electronic Age (4)

Examines influence of computer mediated communication over attitudes, values, beliefs, and behavior. Through a demonstrated and applied awareness, understanding, and comprehension of the online communication processes, we introduce the social and identity perspective, and relationship implications. Theories are considered through readings, discussions and assignments that examine the nature and impact of topics fromsocial interactions, webbased instruction to impres sion management. Ethics, identity, accessibility, relationships, and global implications are explored.

Prerequisite: Upper division standing.
Comm 322 - Mass Communication and Society (4)
A survey of the development of print, broadcast, film, and new communication technology as social, cultural, and economic forces in American society. Examination of news media and their relationship to American political institutions. Discussion of advertising as aneconomic and popular cultural force. Survey of major trends in media research.

## Comm 323U - Introduction to Organizational Communication (4)

The goal of this course is to introduce students to theories that examine how communication works in business contexts. Students will study org anizational management, interpersonal conflict and conflict management in organizations. Students will learn to apply course concepts to business interactions and practices. This course is recommended preparation for Comm 423.

## Comm 325 - Business and Professional Communication

 (4)This dynamic and interactive fully online course introduces the basics of professional communication in the workplace - including interpersonal and small group communication, interviewing and presentations. You will be challenged to use this course to make better sense of your current life situation, and to transformyour experiences into working knowledge. You will assess and make sense of information to influence your communication style and
ultimately empower your professional communication which will support a more productive and collaborative communication process.
Prerequisite: Upper division standing.

## Comm 326 - Communication, Society, and Culture (4)

Develops the idea that communicative action is theoretically driven as introduced in Comm 300; continues the discussion of interpretive, constitutive, social-cultural, and critical theories of communication. Comm 326 is a requirement for the major and a recommended prerequisite for 400-level communication courses.

Prerequisite: Comm 300.

## Comm 327 - Environmental Campaigns (4)

Introduction to the principles of environmental communication andenvironmental campaigns. Students will improve their environmental literacy, learn to communicate about the environment with different audiences, and develop the skills necessary to be a professional environmental communicator. The skills developed in this class will transfer to a variety of communication-related careers.

## Comm 329U- Introduction to Health Communication

 (4)Introduces students to the breadth of health communication theory and research. Course topics include provider-patient communication, social support, uncertainty management, health literacy, and health campaigns.

## Comm 336U- Metaphors in Communication (4)

An introduction to the use and understanding of metaphors in conversation, public communication, and mediated communication. Topics include metaphor comprehension, metaphorical framing, patterns of metaphor use in dis course and interaction of metaphors with communication context. No prior familiarity with the metaphor literature is assumed.

## Comm 337U- Communication and Gender (4)

Study and practice of the skills involved in competent communication (primarily comprehensive lis tening and reading, and speaking and writing) in order to separate myths, as sumptions and notions from the facts, realities and truths about communication and about women and men. Examination of communication and gender topics will include: the role of anger in communicating about gender is sues; the impact of the type of information on discussions about gender; gender difference as a "catch all" explanation for gender problems; the facts of differences
being confused with attitudes about differences; perception of women and men as speaking different languages and communicatorbehaviors as choices.

## Comm 341 - Introduction to Public Relations (4)

An introduction to the principles and practice of professional public relations, focusing on the functions of PR in organizations, the concept of strategic communication in persuasion, relevant professional skills, the role of research, and an understanding of common ethical is sues encountered.

## Comm 342 - Media and Cultural Industries (4)

An overview of the mass media \& cultural industries. Students will examine a range of is sues, such as the institutional, social and technological histories of media and cultural industries, the influence of economic factors in shaping content, and is sues governing regulatory policy. Specialemphas is will be given to media's role in society, the concentration of ownership, the impact of new communication technologies, and increasing convergence of particular media with one another.

## Comm 345 -New Media and Society: Problems and Debates (4)

We live in a world increasingly characterized by changes in media technology. As media and tech evolve, so does the relationship between media, technology and society. From twitter news feeds to smart cities, new media has infiltrated nearly all aspects of life. Through an interrogation of the social, politicaleconomic, and cultural landscape through which these new media develop and operate, students will understand the history, productive forces, impacts, and challenges associated with the new medias cape within which we currently live.

## Comm 346 - Humor, Irony, and Laughter in Communication (4)

An introduction to theories of humor, irony, and laughter from social-interactional perspectives. Particular attention is given to how humor, irony, and laughter are used and understood in conversation and other forms of discourse.

## Comm 362-Bollywood: Communicating Contemporary South Asia through Cinema (4)

Bollywood is a spectrumof major media industries in India and South Asia that produce entertainment for worldwide consumption. Bollywood is a recent term that highlights the transnational character of the Industry, very much like

Hollywood. Specifically we will examine transnational Indian Cinema with the following emphases: 1. globalization and the politics of transnational film production, dis tribution, and reception; 2. local-regionalglobal dynamics; 3. the construction and negotiation of gender, family, nation, religion/communalism, and emerging new filmic genres; 4 . is sues of filmic representation and diasporic identitites.

## Comm 370 - Debates and Forensics (4)

Development of advanced public speaking and argumentation skills. Each student will attend college tournaments and engage in a variety of forensics events, including platform speeches, limited-preparation speeches, interpretive speeches, and teamdebate.

## Comm 389U- Ethics of Human Communication (4)

Applies important ethical theories to communication settings and problems, including aspects of interpersonal, group, organization, public, Internet and mass communication, showing how ethics relate to all communication events. Reveals how communication can either validate or undermine the basic humanity, dignity and value of others in the communication setting.
Prerequisite: junior standing, open to those outside of communication. .

## Comm 398 - Topics in Communication in the Workplace (2-4)

Examine communication in and for the workplace. Different topics will include: leadership, collaboration, consensus, and career-building. You will assess your communication style and critically think about the workforce. Use this course to make better sense of your current life situation and develop working knowledge.

## Comm 399-Special Studies (1-6)

See department for course description. (Credit to be arranged.)

## Comm 401 - Research (1-12)

Consent of instructor. CommunicationLaboratory. See department for course description. (Credit to be arranged.)

## Comm 402 - Independent Study (1-12)

(Credit to be arranged.)

## Comm 403 - Thesis (1-6)

(Credit to be arranged.)

Comm 404 - Cooperative Education/Internship (1-12)
See department for course description. (Credit to be arranged.)

## Comm 405 - Reading and Conference (1-12)

Consent of ins tructor. See department for course description. (Credit to be arranged.)

## Comm 406 -Special Projects (1-8)

Consent of instructor. See department for course description. (Credit to be arranged.)

## Comm 407 -Seminar (1-12)

See department for course description. (Credit to be arranged.)

## Comm 408-Workshop(1-6)

See department for course description. (Credit to be arranged.)

## Comm 409 - Practicum (1-12)

See department for course description. (Credit to be arranged.)

## Comm 410 -SelectedTopics (1-6)

See department for course description. (Credit to be arranged.)

## Comm 412 - Empirical Theories of Mass Communication (4)

Surveys social scientific theories of mass communication.
Also offered for graduate-level credit as Comm 512 and may be taken only once for credit. . Prerequis ite: upperdivision standing. Expected preparation: core communication courses (Comm 300, Comm 311, Comm 316, Comm 326), and Comm 322 ? Mass Communication \& Society.

## Comm 415 - Problems of Intercultural Communication (4)

Builds upon the theories and issues discussed in the introductory course by including contemporary and classical literature on multicultural and intercultural communication. Identifies and analyzes politically constructed categories of race, age, clas s, gender in society against the backdrop of debates on multiculturalis min the United States. Examines categorizations of race, class, etc. in their historical, social, and cultural context, and how those have influenced mass-mediated and interpersonal communication. Uses mass media (television, radio, daily print media, music) texts to provide examples of how we understand ?difference? and ?otherness? in our daily lives.

Also offered for graduate-level credit as Comm 515 and may be taken only once for credit. . Prerequis ite: upperdivision standing. Expected preparation: core communication courses (Comm 300, Comm 311, Comm 316, Comm 326), and Comm 215 ? Introductionto Intercultural Communication. .

## Comm 416-Communicating Environmental Controversies (4)

With a special emphasis on environmental conflicts and controversies, this course explores how communication shapes the way we think about, talk about, and relate to the natural world. The class covers the latest theoretical and practical approaches to environmental communication, the anatomy of environmental controversies, and the different factors that shape public opinion on those controversies within the United States. The goal of this course is to support students in becoming sophisticated consumers and producers of environmental communication.

Also offered for graduate-level credit as Comm 516 and may be taken only once for credit. Prerequisite: Upper division standing.

## Comm 418 - Advanced Interpers onal Communication

 (4)Theory course in which students analyze current concepts and theories related to inter-personalcommunication, comparing and contrasting various models and their relative adequacy in representing the complexity of communication processes. The impact on actual communicative practices is examined. The influence of particular his torical perspectives and contemporary is sues and trends on interpersonal communication is analyzed through evaluation of empirical data and general cultural texts. Research project required.
Also offered for graduate-level credit as Comm 518 and may be taken only once for credit. Prerequisite: upperdivision standing. Expected preparation: core communication courses (Comm 300, Comm 311, Comm 316, Comm 326), and Comm 218 ? Interpersonal Communication..

## Comm 420-Political Communication (4)

An analysis of the relationship of communication to the exercise of politics and political power. Topics may include the ethics and practices of electoral politics, political ideologies, political advertising, propaganda, public opinion formation, the role of mass media as a source and formof political communication, speech writing, public policy writing and analysis, political news writing, and political campaigning. The focus is on how communication strategies and media can be used to organize onsent or dissentto ruling parties, representatives, and ideas.
Also offered for graduate-level credit as Comm 520 and may be taken only once for credit. Prerequisite: upperdivision standing. Expected preparation: core communication courses (Comm 300, Comm 311, Comm 316, Comm 326), and Comm 322-Mass Comm\& Society or Comm 314U- Persuasion. .

## Comm 422 - Critical Theories in Mass Communication

 (4)Surveys critical and institutional theories of mass communication. Primary focus is analysis of the relationship between media and communication institutions and the state and other social institutions.

Also offered for graduate-level credit as Comm 522 and may be taken only once for credit. Prerequisite: upperdivision standing. Expected preparation: core communication courses (Comm 300, Comm 311, Comm 316, Comm 326), and Comm 322-Mass Comm\& Society.

Comm 423 - Advanced Organizational and Strategic Communication (4)

Application of communication theory to the study of human interaction in the organizational context. Examination of the relationships between structural variables in the organization and informal communication channels, organizational culture, and strategic communication. Course requirements include completion and report of a research project.
Also offered for graduate-level credit as Comm 523 and may be taken only once for credit. Prerequisite: upperdivision standing. Expected preparation: core communication courses (Comm 300, Comm 311, Comm 316, Comm 326), and Comm 313U - Communication in Groups or Comm 323U - Introduction to Organizational Communication. .
Comm 427 - Issues in International Communication (4)
A study of historical and contemporary theories and practices in the conduct of trans-border communication. Topics may include international communication is sues of law, diplomacy, conflict, the Cold W ar, international organizations, mass media, information, advertising and news flows, and social-economic development, as well as
discussions of specific cases of cultural and institutional communication, spoken, written and produced, in various industrial and developing societies.
Also offered for graduate-level credit as Comm 527 and may be taken only once for credit. Prerequisite: upperdivision standing. Expected preparation: core communication courses (Comm 300, Comm 311, Comm 316, Comm 326), and Comm 215 - Introduction to Intercultural Communication. .

## Comm 429 - Health Communication Campaigns (4)

In-depth examination of health communication campaigns that promote behavior change using theories at the individual, interpersonal, small group, and community levels. We will explore the current media environment, in which health communication campaigns can utilize a variety of communication channels including mobile phones, social networks, video games, and entertainment television.

Also offered for graduate-level credit as Comm 529 and may be taken only once for credit. Prerequisite: upperdivision standing. Expected preparation: core communication courses (Comm 300, Comm 311, Comm 316, Comm 326), and Comm 314U ? Persuasion or Comm 329U - Introduction to Health Communication. .

## Comm 432-Communication and Technology (4)

Examination of several approaches to communication technology and how it affects human behavior and society. Topics include psychological as pects of communication technology; how design plays a role in the way we use the technology and interact with others; and the ways in which communication technology affects social institutions. Expected preparation: core communication courses (Comm 200, Comm 311, Comm 316, Comm 326).
Also offered for graduate-level credit as Comm 532 and may be taken only once for credit. . Prerequisite: Upperdivision standing.

## Comm 436-Communication and Cognition (4)

Exploration of human communication froma cognitive perspective.
Also offered for graduate-level credit as Comm 536 and may be taken only once for credit. . Prerequisite: upperdivision standing. Expected preparation: core communication courses (Comm 300, Comm 311, Comm 316, Comm 326). .

## Comm 437 - Urban Communication (4)

Course utilizes a cultural, contextual approach to the study of urban communication structures, processes and practices. Macro and micro features are examined with the goal of unders tanding the role of communication in structuring social life in urban environments. Relevant theories on urban life and multiple dimensions of verbal
and nonverbal communication codes are examined as they apply in urban contexts. Theoretical and empirical approaches recognize urb an centers as dynamic multicultural environments. Research project required.
Also offered for graduate-level credit as Comm 537 and may be taken only once for credit. . Prerequisite: upperdivision standing. Expected preparation: core communication courses (Comm 300, Comm 311, Comm 316, Comm 326), and Comm 322 - Mass Comm \& Society. .

## Comm 438 - Everyday Talk: Structure and Process (4)

How humans organize talk, with a primary emphas is on face-to-face talk in an informal setting. Attention will be given to the structure of roles and turns, sequencing of stages and topics, is sues of common ground and relevance, and cognitive processes of message origination and interpretation in particular contexts.
Also offered for graduate-level credit as Comm 538 and may be taken only once for credit. . Prerequis ite: upperdivision standing. Expected preparation: core communication courses (Comm 300, Comm 311, Comm 316, Comm 326), and Comm 218 - Interpersonal Communication or Comm 313U - Communication in Groups..

## Comm 439-Gesture and Meaning in Everyday Talk

 (4)How humans usegesture and vocal intonation in conversation, with a primary emphas is on informal settings, interaction of gesture with language, metaphorical as pects of gesture, and the contribution of gesture to cognitive and interactive processes of mes sage origination and interpretation. Expected preparation: Comm 311 or equivalent; upper-division or graduate standing.
Also offered for graduate-level credit as Comm 539 and may be taken only once for credit. .

## Comm 440 - Metaphor, Play, and Humor (4)

How metaphor, play, humor, and other forms of ?nonserious? language and gesture contribute to the creation of meaning and sustaining of relationships in everyday social interactions. Topics vary fromquarter to quarter, and may include: metaphor; playful communication; humor and irony; and narratives. May be repeated for undergraduate or graduate credit.
Also offered for graduate-level credit as Comm 540 and may be taken only once for credit. . Prerequis ite: upperdivision standing. Expected preparation:core communication courses (Comm 300, Comm 311, Comm 316, Comm 326), and Comm 336U - Metaphors in Communication .

## Comm 442 -Sport, Media and Culture (4)

An in depth examination of the interrelationship between sports and media in contemporary (western) society, and how that interrelationship reinforces social values, sometimes challenges social norms, and draws on the cultural identification of class, race, and gender to identify sports values with cultural values. Drawing on theories of political economy, media studies, and cultural studies, we will examine media's role in telling the story of sports and, in telling that story, shaping and reinforcing cultural values and developing materialimpacts on peoples' lives.

Prerequisite: Upper-division standing.

## Comm 445 - Risk and Strategic Communication (4)

Examination of the theoretical background and the intricacies of risk communication, with a focus on strategic communication. Fromhealth crises to earthquakes to environmental dis asters, this course explores several modern day challenges through a series of cases studies and exercises emphasizing preparation/mitigation, audience analysis, message development, communication channel identification, and outcome evaluation. Expected preparation: research methods (e.g Comm311).
Also offered for graduate-level credit as Comm 545 and may be taken only once for credit. Prerequisite: Upperdivis ion standing.

## Comm 448 - Science Communication (4)

Centers on how we focus a critical lens on how issues in science and theenvironment are communicated. Students are asked to examine the question: "How do we know what we know?" by exploring how scientists, policy-makers, lay publics and mass media practitioners understand and communicate in this domain. Students examine how scientific meanings are produced in public arenas, ranging from such issues as childhood vaccines to the discovery of ancient mummies.

Also offered for graduate-level credit as Comm 548 and may be taken only once for credit. Prerequisite: Comm 311.

## Comm 452 - Gender and Race in the Media (4)

Primarily examines the representations of gender and race, including age, class and sexual orientation in various media (mainstreamand alternative), and will examine theoretical and methodological approaches which may be used to interpret these representations. In addition, considers the potential impact that media institutions have on people's lives, political decisions and social relations. The overall aim is for students to understand how their own cultural identities affect their media consumption and social positioning. Expected preparation: core communication courses (Comm 200, Comm 311, Comm 316, Comm 326), and Comm 322.

Also offered for graduate-level credit as Comm 552 and may be taken only once for credit. . Prerequisite: upperdivision standing. . Cross-Listed as: WS 452.

## Comm 460 - Framing and Mass Media (4)

Examines how mes sages are constructed and the effects frames have on audiences. Framing theory is linked to propaganda, public relations, marketing, political communication and cognition, and has a rich theoretical and methodological tradition. Examines the conceptual definitions, and the underpinning theory and methodology used in framing scholarship. Agenda setting, bias and framing, public opinion formation, cultivation analysis, behavioral effects, and macrolevel and microlevel methods are also examined.

Also offered for graduate-level credit as Comm 560 and may be taken only once for credit. . Prerequis ite: upperdivision standing. Expected preparation: core communication courses (Comm 300, Comm 311, Comm 316, Comm 326), and Comm 322 - Mass Comm \& Society .

## Comm 472 - Communication and Public Opinion Seminar (4)

This course explores research questions that relate to mass communication and American public opinion. Important normative and philosophical is sues are identified and reviewed via early writings (ca. 1900) in social philos ophy and socials cience. These issues are further investigated by examining relevant work from sociology, s ocial psychology, and mas s communication.
Also offered for graduate-level credit as Comm 572 and may be taken only once for credit. . Prerequisite: upperdivision standing. Expected preparation: core communication courses and Comm314U Persuasion.

Comm 487 - Propaganda, Public Relations, and Media (4)

The courseencourages students to think critically about how mass media promote ideologies and agend as to influence opinion, policies and sales. Theories of media effects, propaganda and public relations explored.
Also offered for graduate-level credit as Comm 587 and may be taken only once for credit. . Prerequis ite: upperdivision standing with expected preparation in mass media and persuasion theories.

## Comm 489-Media Ethics (4)

Applies important ethical theories to decision making within the mass media, including considerations of personal, org anizational, professional and cultural understandings of ethics to analyze how decisions regarding media content are made. Provides guidelines for identifying and understanding ethicaldilemmas commonly encountered by media professionals and helpin making
theory-grounded decisions in print and broadcast journalism, advertising and public relations, the Internet, and entertainment media.

Prerequisite: junior, senior or graduate standing.

## Comm 501 - Research (1-9)

Consent of instructor. Communication Laboratory. See department for course description. (Credit to be arranged.)

## Comm 502 - Independent Study (1-6)

(Credit to be arranged.)

## Comm 503 -Thesis (1-9)

See department for course description. (Credit to be arranged.)

## Comm 504-Cooperative Education/Internship (1-9)

See department for course description. (Credit to be arranged.)

## Comm 505 - Reading and Conference (1-9)

Consent of instructor. See department for course description. (Credit to be arranged.)

## Comm 506 -Special Projects (1-9)

See department for course description. (Credit to be arranged.)

## Comm 507-Seminar (1-6)

See department for course description. (Credit to be arranged.)

## Comm 508-Workshop(0-6)

See department for course description. (Credit to be arranged.)

## Comm 509-Practicum(1-9)

See department for course description. (Credit to be arranged.)

## Comm 510 - SelectedTopics (1-6)

See department for course description. (Credit to be arranged.)

Comm 511 - Introduction to Communication Theory (4)

Introduction to the theoretical perspectives currently represented in the department, with attention to metatheoretical considerations including ontology, epis temology, and axiology, and how these considerations shape the understanding of key concepts. Students will learn to critique and synthesize theoretical literature within each perspective.

## Comm 512 - Empirical Theories of Mass Communication (4)

Surveys social scientific theories of mass communication.
Also offered for undergraduate-level credit as Comm412 and may be taken only once forcredit. . Prerequisite: upper-division standing. Expected preparation: core communication courses (Comm 300, Comm 311, Comm 316, Comm 326), and Comm 322 ? Mass Communication \& Society.

## Comm 513 - Seminar: Communication in Institutional Contexts (4)

Various configurations and features of institutional life are examined. The impact of culture, politics, media on org anizational communicative structures and processes, communication consultation, institutional-community interface are among the topics covered. Current research is examined. Students conduct an organizational research project.

Prerequis ite: graduate standing or instructor permis sion. Repeatable for credit.

## Comm 514 - Topics in Communication, Culture, and Community (4)

Examination and analysis of human symbolic activity as the management of meaning, with the capacity to shape and influence thought, action, and world view. Particular attention given to assumptions regarding intent, effects, meaning, understanding, and interpretation, and their implications for studying communication frommodernist and post-modernist perspectives. Specific topics vary with instructor. May be repeated for graduate credit.

## Comm 515 - Problems of Intercultural Communication (4)

Builds upon the theories and issues discussed in the introductory course by including contemporary and classical literature on multicultural and intercultural communication. Identifies and analyzes politically constructed categories of race, age, clas s, gender in society against the backdrop of debates on multiculturalis min the United States. Examines categorizations of race, class, etc. in their historical, social, and cultural context, and how those have influenced mass-mediated and interpersonal communication. Uses mass media (television, radio, daily print media, music) texts to provide examples of how we understand ?difference? and ?otherness? in our daily lives.

Also offered for undergraduate-levelcredit as Comm415 and may be taken only once for credit. Prerequisite: upperdivision standing. Expected preparation: core communication courses (Comm 300, Comm 311, Comm 316, Comm 326), and Comm 215 ? Introduction to Intercultural Communication. .

## Comm 516 - Communicating Environmental Controversies (4)

With a special emphasis on environmental extremes and controversies, this course explores how every day communication shapes the way we think about, talk about, and relate to the natural world. The class covers the latest theoretical and practical approaches to environmental communication, the makeup of environmental controversies, and the different factors that shape public opinion on those controversies within the United States. The goal of this course is to support students in becoming sophisticated consumers and producers of environmental communication. Expected prep: Comm 300, Comm 311.
Also offered for undergraduate-level credit as Comm416 and may be taken only once for credit.
Comm 518 - Advanced Interpersonal Communication (4)

Theory course in which students analyze current concepts and theories related to inter-personalcommunication, comparing and contrasting various models and their relative adequacy in representing the complexity of communication processes. The impact on actual communicative practices is examined. The influence of particular historical perspectives and contemporary issues and trends on interpersonal communication is analyzed through evaluation of empirical data and general cultural texts. Research project required.
Also offered for undergraduate-levelcredit as Comm418 and may be taken only once for credit. Prerequisite: upperdivision standing. Expected preparation: core communication courses (Comm 300, Comm 311, Comm 316, Comm 326), and Comm 218 ? Interpersonal Communication. .

## Comm 520-Political Communication (4)

An analysis of the relationship of communication to the exercise of politics and political power. Topics may include the ethics and practices of electoral politics, political ideologies, political advertising, propaganda, public opinion formation, the role of mass media as a source and formof political communication, speech writing, public policy writing and analysis, political news writing, and political campaigning. The focus is on how communication strategies and media can be used to organize onsent or dissentto ruling parties, representatives, and ideas.
Also offered for undergraduate-level credit as Comm420 and may be taken only once for credit. Prerequisite: upperdivision standing. Expected preparation: core communication courses (Comm 300, Comm 311, Comm 316, Comm 326), and Comm 322-Mass Comm\& Society or Comm 314U - Persuasion. .

## Comm 521 - Quantitative Methods in Communication Research (4)

An examination of the methods of quantitativeempirical research in communication. Emphasis is uponselected research designs, datacollection and analysis, data input for computer analy sis with statistical packages, results interpretation, and writing reports of completed research.

## Comm 522 - Critical Theories in Mass Communication

 (4)Surveys critical and institutional theories of mass communication. Primary focus is analysis of the relationship between media and communication institutions and the state and other social institutions.

Also offered for undergraduate-level credit as Comm422 and may be taken only once for credit. Prerequisite: upperdivision standing. Expected preparation: core communication courses (Comm 300, Comm 311, Comm 316, Comm 326), and Comm 322-Mass Comm\& Society.

## Comm 523 - Advanced Organizational and Strategic Communication (4)

Application of communication theory to the study of human interaction in the organizational context. Examination of the relationships between structural variables in the organization and informal communication channels, organizational culture, and strategic communication. Course requirements include completion and report of a research project.
Also offered for undergraduate-level credit as Comm423 and may be taken only once for credit. Prerequisite: upperdivision standing. Expected preparation: core communication courses (Comm 300, Comm 311, Comm

316, Comm 326), and Comm 313U - Communication in Groups orComm 323U - Introduction to Organizational Communication. .

## Comm 525 - International Communication and Culture (4)

Study and analysis of the international dimensions of communication. Focus is on understanding thecultural and power contexts and differences among and between peoples and institutions that establish the boundaries in the exchange of meanings, values, and ideas. Emphas is is given to questions of cultural, economic and political sovereignty in the pursuit of national, regional, and personal identity and development.

## Comm 527 - Issues in International Communication (4)

A study of historical and contemporary theories and practices in the conduct of trans-border communication. Topics may include international communication is sues of law, diplomacy, conflict, the Cold War, international org anizations, mass media, information, advertising and news flows, and social-economic development, as well as discussions of specific cases of cultural and institutional communication, spoken, written and produced, in various industrial and developing societies.
Also offered for undergraduate-levelcredit as Comm427 and may be taken only once for credit. Prerequisite: upperdivision standing. Expected preparation: core communication courses (Comm 300, Comm 311, Comm 316, Comm 326), and Comm 215 - Introduction to Intercultural Communication. .

## Comm 528 -Seminar: Communication in Relational Contexts (4)

Advanced work in interpersonal communication theories, and concepts such as family, aging, and conflict. Critique of current research in light of such considerations as cultural constraints, shifts in relational definitions and configurations. Research project.
Prerequisite: graduate standing or permis sion of instructor.

## Comm 529 - Health Communication Campaigns (4)

In-depth examination of health communication campaigns that promote behavior change using theories at the individual, interpersonal, small group, and community levels. We will explore the current media environment, in which health communication campaigns can utilize a variety of communication channels including mobile phones, social networks, video games, and entertainment television.

Also offered for undergraduate-levelcredit as Comm429 and may be taken only once for credit. . Prerequisite: upper-division standing. Expected preparation: core communication courses (Comm 300, Comm 311, Comm

316, Comm 326), and Comm 314U ? Persuasion or Comm 329U - Introduction to Health Communication. .

## Comm 531 - Qualitative Methods in Communication

 Research (4)An examination of naturalistic empirical communication research and the as sumptive bases. Particular attention given to descriptive, interpretive, and critical approaches for analys is, and to specific methods of participant observation, interviewing, and textual analysis. Critical examination of selected research as models for original studentresearch.

Prerequisite: Comm511.

## Comm 532-Communication and Technology (4)

Examination of several approaches to communication technology and how it affects human behavior and society. Topics include psychological as pects of communication technology; how design plays a role in the way we use the technology and interact with others; and the ways in which communication technology affects social institutions. Expected preparation: core communication courses (Comm 200, Comm 311, Comm 316, Comm 326).
Also offered for undergraduate-level credit as Comm432 and may be taken only once for credit. .

Comm 533-Seminar: Organizational Communication (4)

Examines the implications of evolving perspectives in organizational theory, as well as cultural factors which may influence communication processes in the org anizational context. Different approaches to assessing organizational communication processes are considered with relevance to enhancing organizationaleffectiveness and facilitating org anizational transition and change. Course requirements include completion and report of a research project.

## Comm 536-Communication and Cognition (4)

Exploration of human communication from a cognitive perspective.
Also offered for undergraduate-level credit as Comm436 and may be taken only once forcredit. . Prerequisite: upper-division standing. Expected preparation: core communication courses (Comm 300, Comm 311, Comm 316, Comm 326). .

## Comm 537 - Urban Communication (4)

Course utilizes a cultural, contextual approach to the study of urban communication structures, processes and practices. Macro and micro features are examined with the goal of unders tanding the role of communication in structuring sociallife in urban environments. Relevant theories on urban life and multiple dimens ions of verbal
and nonverbal communication codes are examined as they apply in urban contexts. Theoretical and empirical approaches recognize urban centers as dynamic multicultural environments. Research project required.
Also offered for undergraduate-levelcredit as Comm437 and may be taken only once for credit. . Prerequisite: upper-division standing. Expected preparation: core communication courses (Comm 300, Comm 311, Comm 316, Comm 326), and Comm 322 - Mass Comm \& Society..

## Comm 538 - Everyday Talk:Structure and Process (4)

How humans organize talk, with a primary emphas is on face-to-face talk in an informal setting. Attention will be given to the structure of roles and turns, sequencing of stages and topics, is sues of common ground and relevance, and cognitive processes of mes sage origination and interpretation in particular contexts.
Also offered for undergraduate-levelcredit as Comm438 and may be taken only once for credit. . Prerequisite: upper-division standing. Expected preparation: core communication courses (Comm 300, Comm 311, Comm 316, Comm 326), and Comm 218 - Interpersonal Communication or Comm 313U - Communication in Groups. .

## Comm 539-Gesture and Meaning in Everyday Talk

 (4)How humans usegesture and vocal intonation in conversation, with a primary emphasis on informal settings, interaction of gesture with language, metaphorical aspects of gesture, and the contribution of gesture to cognitive and interactive processes of mes sage origination and interpretation. Expected preparation: Comm 311 or equivalent; upper-division or graduate standing.
Also offered for undergraduate-levelcredit as Comm439 and may be taken only once for credit. .

## Comm 540 - Metaphor, Play, and Humor (4)

How metaphor, play, humor, and other forms of ?nonserious? language and gesture contribute to the creation of meaning and sustaining of relationships in everyday social interactions. Topics vary fromquarter to quarter, and may include: metaphor; playful communication; humor and irony; and narratives. May be repeated for undergraduate or graduate credit.

Also offered for undergraduate-levelcredit as Comm440 and may be taken only once for credit. . Prerequis ite: upper-division standing. Expected preparation: core communication courses (Comm 300, Comm 311, Comm 316, Comm 326), and Comm 336U - Metaphors in Communication.

## Comm 541 - Methods of Rhetorical Criticism (4)

An examination of philosophical and conceptual bases of contemporary rhetorical theory and their implications for the conduct of rhetorical criticism. Selected approaches to criticis mexamined, along with exemplars for analysis. Special attention given to critical invention, and to the social positioning of the critic. Students will select and examine a specific example of contemporary rhetoric.
Prerequisite: Sp 511.

## Comm 545 - Risk and Strategic Communication (4)

Examination of the theoretical background and the intricacies of risk communication, with a focus on strategic communication. From health crises to earthquakes to environmentaldis asters, this course explores several modern day challenges through a series of cases studies and exercises emphasizing preparation/mitigation, audience analysis, mes sage development, communication channel identification, and outcome evaluation. Expected preparation: research methods.

Also offered for undergraduate-level credit as Comm445 and may be taken only once for credit. Prerequisite: Graduate standing. Cross-Listed as: This is the same course as EMCR 545 and may be taken only once for credit.

## Comm 548 - Science Communication (4)

Centers on how we focus a critical lens on how is sues in science and theenvironment are communicated. Students are asked to examine the question: "How do we know what we know?" by exploring how scientists, policy-makers, lay publics andmass media practitioners understand and communicate in this domain. Students examine how scientific meanings are produced in public arenas, ranging from such issues as childhood vaccines to the discovery of ancient mummies.
Also offered for undergraduate-level credit as Comm448 and may be taken only once forcredit.

## Comm 552 - Gender and Race in the Media (4)

Primarily examines the representations of gender and race, including age, class and sexual orientation in various media (mainstreamand alternative), and will examine theoretical and methodological approaches which may be used to interpret these representations. In addition, considers the potential impact that media institutions have on people's lives, politicaldecis ions and social relations. The overall aim is for students to understand how their own cultural identities affect their media consumption and social positioning.
Also offered for undergraduate-level credit as Comm452 and may be taken only once for credit. . Cross-Listed as: WS 552.

## Comm 556 -Seminar: Topics in Language, Meaning, and Interpretation (4)

Exploration of cognitive, linguistic, and interpretive approaches of emerging interest in the study of human communication. Specific topics vary with instructor. May be repeated for graduatecredit.
Prerequisite: graduatestanding.

## Comm 560 - Framing and Mass Media (4)

Examines how messages are constructed and the effects frames have on audiences. Framing theory is linked to propaganda, public relations, marketing, political communication and cognition, and has a rich theoretical and methodological tradition. Examines the conceptual definitions, and the underpinning theory and methodology used in framing scholarship. Agenda setting, bias and framing, public opinion formation, cultivation analysis, behavioral effects, and macrolevel and microlevel methods are also examined.
Also offered for undergraduate-level credit as Comm460 and may be taken only once for credit. . Prerequisite: upper-division standing. Expected preparation: core communication courses (Comm 300, Comm 311, Comm 316, Comm 326), and Comm 322 - Mass Comm \& Society..

## Comm 572 - Communication and Public Opinion

 Seminar (4)This course explores research questions that relate to mass communication and American public opinion. Important normative and philosophical is sues are identified and reviewed via early writings (ca. 1900) in social philos ophy and social science. These issues are further investigated by examining relevant work from sociology, social psychology, and mass communication.
Also offered for undergraduate-level credit as Comm472 and may be taken only once for credit. . Prerequisite: upper-division standing. Expected preparation: core communication courses and Comm314U Persuasion.
Comm 587 - Propaganda, Public Relations, and Media (4)

The courseencourages students to think critically about how mass media promote ideologies and agendas to influence opinion, policies and sales. Theories of media effects, propaganda and public relations explored.
Also offered for undergraduate-levelcredit as Comm487 and may be taken only once for credit. . Prerequis ite: upper-division standing with expected preparation in mass media and persuasion theories.

## Comm 589-Media Ethics (4)

Applies important ethical theories to decision making within the mass media, including considerations of
personal, organizational, professional and cultural understandings of ethics to analyze how decisions regarding media content are made. Provides guidelines for identifying and understanding ethical dilemmas commonly encountered by media professionals and help in making theory-grounded decisions in print and broadcast journalism, advertising and public relations, the Internet, and entertainment media.
Prerequisite: junior, senior or graduate standing.

## COTA - College of the Arts

COTA 135 - Artistas Citizen: A Survey of Art Activism (2)
Examines art activismand the artist's role in pursuing socialchange. Through reflection on their own values, beliefs, and artistic agency, as well as studying a broad spectrum of artis tic eng agement-fromgrassroots creativity to global celebrity culture-students will gain an understanding of the ways that artists eng age with communities, and address contemporary issues in society. Guests will visit through the termto share their work and discuss art activismin practice.

## COTA 199 - Special Studies (1-8)

(Credit to be arranged.)

## COTA 235 - Artist as Citizen: Social Justice Movements, Artistic Res ponse and Impact (2)

Examine and discuss current and past social justice movements: including global and nationalefforts. Research and report on artistic responses fromdiverse socialjustice movements. Investigate and consider actions taken to create change as a result of the activism. Explore how art and social justice activism work together effectively, what the next steps are after the painthas dried.

Prerequisite: COTA 135 or permis sion of ins tructor.

## COTA 335 - Artist as Citizen: Engage in Art Activism

 (2)Provides a hands-on, community-based experience that delves into the process of artistic activism. Students will collaborate with their peers, and arts-related community partners and eng age with K-5 public school students to examine social-justice is sues, and create and share artis tic responses that reflect these is sues. In the process, examining their roles as both artists and socially engaged members of their communities. This course is repeatable for up to 4 credits.

COTA 399-Special Studies (1-8)
(Credit to be arranged.)

COTA 405 - Reading and Conference (1-12)

## Coun - Counseling

Coun 199 -Special Studies (1-4)
(Credit to be arranged.)

## Coun 401 - Research (1-6)

(Credit to be arranged.)

## Coun 402 -Independent Study (1-9)

(Credit to be arranged.)

## Coun 403 -Thesis (1-6)

(Credit to be arranged.)

## Coun 405 - Reading and Conference (1-6)

(Credit to be arranged.)

## Coun 406 -Special Problems (1-6)

(Credit to be arranged.)

## Coun 407 -Seminar (1-6)

(Credit to be arranged.)

## Coun 408-Workshop(1-6)

(Credit to be arranged.)

## Coun 409 -Practicum(1-12)

(Credit to be arranged.)

## Coun 410 - Experimental Course (1-6)

(Credit to be arranged.)

## Coun 425 - Guidance for the ClassroomTeacher (3)

A study of the responsibilities and procedures of teachers for guiding students at all levels in becoming more effective and capable persons. Expected preparation: completion of 135 credits; student teaching or teaching experience.
Also offered for graduate-level credit as Coun 525 and may be taken only once for credit. .
Coun 430 - Introduction to Psychiatric Diagnoses (3)
Covers the causation, criteria, diagnosis and classification of the majorpsychiatric disorders. Emphasis is placed on both the traditional medical model and on the psychosocial model of diagnosis. Developmental aspects associated with normal and abnormal pers onalities will also be discussed. This course is a prerequisite for the Counselor Education graduate programs and will not be credited toward the completion of the degrees. Expected preparation: Psy 311.
Also offered for graduate-level credit as Coun 530 and may be taken only once for credit. .
Coun 437 - Current Issues in Addictions Counseling (3)
Presentation of current is sues and new developments in the treatment of substance abusing clients. Emphas is is on new knowledge fromresearch and current trends in treatment with particular focus on the interface between chemical dependency and mental health.
Also offered for graduate-level credit as Coun 537 and may be taken only once for credit.

## Coun 441 - Introduction to Counseling (3)

This course provides an introduction to the counseling profession. Specifically, it focuses on introducing theories and skills related to working with individuals, groups, and families across a variety of settings. It also provides an introduction to various career and educational options within the counseling profession.

Also offered for graduate-level credit as Coun 541 and may be taken only once for credit.
Coun 445 - Youth at Risk (3)
Designed to provide participants with an overview of information focused on counseling and teaching youth-atrisk. Emphas is will be placed on identifying youth-at-risk for depression, suicide, eating disorders, pregnancy, AIDS, use and abuse of alcohol and drugs, homelessness, gang membership and several other at-risk behaviors. Ideas for primary, secondary and tertiary prevention from individual, family, school and community perspectives will also be presented. Particular attention will be paid to guidelines for development of tragedy response plans for school campuses in conjunction with the topic of tertiary prevention. Presented in a varied format structured to
include lecture/discussion, audio-visual presentations, participant self-evaluation of their own at-risk behaviors, role-plays and small group discussion.

Also offered for graduate-level credit as Coun 545 and may be taken only once for credit.

Coun 501 - Research (1-9)
(Credit to be arranged.)

## Coun 502 -Independent Study (1-9)

(Credit to be arranged.)

## Coun 503 -Thesis (1-9)

(Credit to be arranged.)

## Coun 504 - Internship (1-9)

(Credit to be arranged.)

## Coun 505 - Reading and Conference (1-6)

(Credit to be arranged.)

## Coun 506 -Special Problems (1-6)

(Credit to be arranged.)

## Coun 507 -Seminar (1-6)

(Credit to be arranged.)

## Coun 508 -Workshop(1-6)

(Credit to be arranged.)

## Coun 509-Practicum(1-15)

(Credit to be arranged.)

## Coun 510 - Experimental Course (1-12)

(Credit to be arranged.)

## Coun 520-Collaborative Partnerships toSupport Infants and Toddllers (1-3)

Development and maintenance of effective partnerships among service providers and their respective systems is
fundamental to the provision of quality services for infants, young children and their families. Students will examine systems of care and the impact of different systems from the perspective of family and community.

## Coun 525 - Guidance for the ClassroomTeacher (3)

A study of the responsibilities and procedures of teachers for guiding students at all levels in becoming more effective and capable persons. Expected preparation: completion of 135 credits; student teaching or teaching experience.

Also offered for undergraduate-level credit as Coun 425 and may be taken only once for credit. .

Coun 526 - Effective Teaching (2)
Designed to meet the education and student teaching requirements for track II school counseling students. Topics covered include effective teaching strategies designed to help school counselors-in-training to meet the TSPC prescribed teaching competencies: planning for instruction, establishing a clas sroomclimate conducive to learning, implementing instructional plans, evaluating pupil achievement, fostering professional relationships, and addressing organizational expectations. Students are required to complete a 200 -hour teaching practicumin the field ( 125 hours of observation and 75 hours as classroom teacher) and complete a work sample. Students are expected to complete two credits pertermduring one school year for a total of six credits. Restricted to students admitted to the track II school counselor specialization.

Coun 527 - Counseling Individuals with Diverse Needs (3)

Designed to prepare counselors to provide collaborative services for individuals with diverse needs in elementary, secondary, and postsecondary educational settings. Topics will include an overview of the legal mandates that impact educational requirements and services for students with disabilities, including eligibility and various types of disabling conditions related to educational success. Issues related to counseling students and family members, trans itional planning, and collaborating with special educators and other services providers will also be covered.

## Coun 530 - Introduction to Psychiatric Diagnoses (3)

Covers the causation, criteria, diagnosis and classification of the majorpsychiatric disorders. Emphasis is placed on both the traditional medical model and on the psychosocial model of diagnosis. Developmental aspects associated with normal and abnormal pers onalities will also be discussed. This course is a prerequisite for the Counselor

Education graduate programs and will not be credited toward the completion of the degrees.

Also offered for undergraduate-levelcredit as Coun 430 and may be taken only once for credit. .

## Coun 531 -Foundations of Addictions Counseling (3)

Provides an overview of the biological, psychological, social, and spiritual dimensions of substance use disorders. Emphasizes the developmental course of addictions and the relationship of addictive behavior to common psychological dis orders. Models and theories of addictive behavior that counselors need to treatclients with addictive and co-occurring dis orders are reviewed.

## Coun 532 -Assessment and Diagnosis in Addictions Counseling (3)

Focuses on the development of the knowledge and skills of as sessment and diagnosis of psychoactive substance use dis orders. The elements of the bio-psychosocial as sessment process, including basic interviewing and motiv ational interviewing skills, will be reviewed, as well as standardized screening and as sessment in struments for chemicaldependency.

## Coun 533 - Treatment of Subs tance Use Disorders I(3)

Focuses on the development of the knowledge and skills of treatment planning and implementation of individualized treatment for psychoactive substance use disorders. Students will review the various modalities of substance use disorder treatment along with the efficacy and indications of each modality. This is the first course in a sequence oftwo: Coun 533, Coun 534 and must be taken in sequence.
Prerequisite: Coun 532.

## Coun 534 - Treatment of Substance Use Dis orders II (3)

Focuses on the knowledge and skills of substance use disorder treatment fordiverseclient populations. Includes HIV/infectious diseases and how to complete a risk assessment. Examines the ethical and professional issues involved in addictions counseling. Focuses on practical skills including documentation, treatment planning, and clinical interventions. This is the second course in a sequence of two: Coun 533, Coun 534 and must be taken in sequence.
Prerequisite: Coun 533.

## Coun 535 -Co-Occurring Disorders (3)

Focuses on helping individuals who suffer fromcooccurring psychiatric and substance use disorders by examining state of the art treatment approaches and the
public policy and programmanagement challenges that exist in responding to this complexpopulation.

Prerequisite: Coun 531.

## Coun 536 - Addictions Counseling Capstone (3)

Merges theoretical components of addiction treatment with practical applications. Students practice counseling skills through role-plays of client is sues. Practice domains include individual and group counseling skills, counseling diverse populations, and working with co-occurring disorders.

Prerequisite: Coun 534.

## Coun 537 - Current Issues in Addictions Counseling (3)

Presentation of current is sues and new developments in the treatment of substance abusing clients. Emphas is is on new knowledge fromresearch and current trends in treatment with particular focus on the interface between chemical dependency and mental health.
Also offered for undergraduate-level credit as Coun 437 and may be taken only once forcredit.

## Coun 541 - Introduction to Counseling (3)

This course provides an introduction to the counseling profession. Specifically, it focuses on introducing theories and skills related to working with individuals, groups, and families across a variety of settings. It also provides an introduction to various career and educational options within the counseling profession.
Also offered for undergraduate-level credit as Coun 441 and may be taken only once forcredit.
Coun 543 - Interpersonal Relations II (3)
Focuses on the development of foundational active listening, counseling skills. The course is taken concurrently with Coun 509 PracticumCounseling.

## Coun 544 - Consultation: Theory and Practice (2)

Focus on the theory and practice of consultation and collaboration with various populations (e.g., parents, families, clinical practitioners) and across a variety of settings, particularly mental health agencies and schools. Class time will include lecture/discussions, experiential exercises, and studentgroup presentations.
Prerequisite:graduatestanding.
Coun 545 - Youth at Risk (3)
Designed to provide participants with an overview of information focused on counseling and teaching youth-atrisk. Emphas is will be placed on identifying youth-at-risk for depression, suicide, eating disorders, pregnancy, AIDS, use and abuse of alcohol and drugs, homelessness, gang
membership and several other at-risk behaviors. Ideas for primary, secondary and tertiary prevention from individual, family, school and community perspectives will also be presented. Particular attention will be paid to guidelines for development of tragedy res ponse plans for school campuses in conjunction with the topic of tertiary prevention. Presented in a varied format structured to include lecture/discussion, audio-visual presentations, participant self-evaluation of their own at-risk behaviors, role-plays and small group discussion.

Also offered for undergraduate-levelcredit as Coun 445 and may be taken only once for credit.

## Coun 546 - Grief and Loss (2)

Focus on developing knowledge and skills related to counseling individuals and families having experienced loss through death. Students will receive information about theories of grief, explore the neurobiology of the brain in relation to trauma, recognize factors that complicate grief and develop counseling strategies for working with these is sues.

Prerequisite: graduate standing.

## Coun 547 -Legal \& Ethical Issues in School Counseling (1)

Focus on the legal and ethical considerations specifically related to the practice of school counseling. Clas stime will include lecture/discussions, experiential exercises, and completion of case vignettes related to common legal and ethicalissues.

Prerequisite: graduate standing.

## Coun 551 - Theories and Interventions I (3)

This course focuses on providing an overview of counseling theories and their practical applications with various populations. The emphasis will be on learning the key concepts of each major theory across three dimensions: (a) human nature, (b) pathology, and (c) treatment. Focus will also be on conceptually applying each theory to client cases and on understanding underlying values and common elements across theories. Graduate standing is a prerequisite for this class.

## Coun 552 - Theories and Interventions II (3)

This course focuses on providing an overview of advanced and contemporary counseling theories and their practical applications with various populations. The emphasis will be on learning the key concepts of each major theory across three dimens ions: (a) human nature, (b) pathology, and (c) treatment. Focus will also be on conceptually apply ing each theory to client cases. Completion of Coun 551 is a prerequisite for this class.

## Coun 553 - Advanced Therapeutic Strategies (3)

Focuses on advanced interventions for clients seeking pers onalcounseling. Emphasis is focused upon cognitivebehavioral, brief therapy, and selected experiential interventions and their use in treatment planning. The theory and research connected with the application of these interventions in the treatment planning process is also addressed.
Prerequisite: Coun 551, 552.
Coun 555 - Counseling Children and Youth (3)
Theoretical overview of growth and development of children and youth. Emphasis on translating theory into practice through a "person environment interaction" conception of counseling, consultation, and educational intervention in school settings.

## Coun 566 - Appraisal Instruments (1)

Accompanies Coun 567 and is intended to be an evaluation and application practicumof tests used in each counselor education specialty track. Must be taken concurrently with Coun 567.

## Coun 567 - Using Tests in Counseling (3)

The course is a graduate levelintroduction to testing. It offers the student theoption of testusage in the counseling process and introduces issues related to such usage. In addition, the course acquaints the student, through handson experience, with test taking, scoring, norming, profiling and interpreting.
Prerequisite: Coun 541.

## Coun 568 - Career and Lifestyle Planning (3)

This course examines the theoretical research foundation for career choices, factors that influence choices, the role of information, the skills and practices of effective helpers, the exploration/ testing/labor market information sources which contribute to the value choices that are made, and related issues and problems.
Prerequisite: admis sion to the programand Coun 541.
Coun 569 - Developmental Foundations of Counseling (3)

Theoretical overview of life-span growth and development, emphas izing cognitive-intellectual, cognitive-moral, emotional-self, and social as pects of developmental growth in the human being. Emphasis on translating theory into practice through a "person-environment interaction" conception of counseling, consultation, andeducational intervention.

## Coun 570 - Ethical and Legal Issues in Counseling (3)

Designed to further develop the professional identity of counselors by studying the content and application of the ethical standards of the American Counseling Association, the American Psychological Association, and related profes sional org anizations. Also addresses legal is sues in counseling and laws that affect the practice of counseling. Course content includes respecting diversity; client welfare; informed consent; confidentiality and privileged communication; records, technology, and court subpoenas; competence and malpractice; boundary issues; child and adolescent clients; family and group counseling; evaluation, testing, and diagnosis; supervision and consultation, conducting research and methods of resolving ethical and legal issues.

## Coun 571 - Group Counseling (3)

This course is designed to providestudents with opportunities to learn about group counseling theories and skills. Particular emphasis will be placed on understanding group dynamics and leadership skills as they may apply to different populations and settings. Class time will include lecture/discussion and group-based experiential learning.

## Coun 572 -Systemic Perspectives on Human Sexuality (3)

Designed to provide participants with the opportunity to study the expression of human sexuality and intimacy across the life span as well as strategies to both facilitate healthy sexual development and overcome common sexual functioning problems. Students will be as sisted in the process of recognizing personal attitudes and values about various aspects of sexuality and their effect on practice as well as the process of comfortably discussing sexuality with individuals and couples. Also addresses the impact of sexual abuse and sexuality and treatment considerations. Presented in a varied format structured to include lecture/discussion, audio-visual presentations, participant self-evaluation of theirown attitudes and values, role plays and small group discussion.

## Coun 573 -Contemporary Couples, Marriage, and Family Systems (3)

Focus on contemporary couples, marriage and family systems as they exist in American society today. Explore the past, present, and future of these systems, including changing demographics and their implications for professionals.

## Coun 574 - Family Life Cycle and Transitions (3)

Intended for graduate students taking the MFT series, this course examines family development as a foundational framework for family therapy. The developmental context provides opportunity to consider symptoms and dysfunction as related to tasks and challenges of reorg anization at transition points.

## Coun 575 - Foundations of Couples, Marriage, and Family Counseling (3)

This course constitutes an introduction to the theory and methodology of marriage and family counseling. Attention is given to the major family interactional patterns which lead to family systembreakdowns as well as the development of skills in the identification of such patterns. Family process assessment techniques, beginning work with families, dealing with resistance in family counseling, use of "self," doubling, sculpting, etc., are interventions which are taught using an experiential format.

## Coun 576 - Parents, Families, and Communities in Schools (3)

Examines effective methods for including parents, families, and communities in schools. Emphasizes a systems perspective that includes consultation and collaboration in addressing academic, career, and personal/social success for all students. Family dynamics and influences on school success will be addressed. Application of school counseling consultation, collaboration, and family support for all students will result in a school-based project integrated into a school's comprehensive counseling program.

## Coun 577 - Family Therapy (3)

This course will provide an overview of family therapy, particularly related to parent-child relationships. Families will be understood from practical, structural, intergenerational, cultural, developmental, topical, and process perspectives. A foundation in family therapy theory is a prerequisitefor this course; the emphasis here will be on application of theory and the development of family therapy skills. Experiential learning (role plays) will occur during class, with participation required fromall students.

## Coun 578 - Couples Therapy (3)

Students learn to conceptualize and intervene systematically with couple units. Attention is given to maintaining therapeutic balance, developing an intersystem treatment plan, and asking systemic/interactional
questions. A major emphas is is supervised skill practice through role play.

## Coun 579 - Advanced Systemic Interventions: Couples and Families (3)

Intended for graduate students taking the MFT series, this course analy zes current therapeutic assessment tools and interventions grounded in systemic theory/research as they pertain to family transitions. Success in this course builds upon requisite mastery of major systemic concepts that have to do with systemic function, structure, and motivation as related to assessing similarities and differences between normative and paranormative marriage and family life transitions. Appropriate systemic as sessment integrates with systemic therapeutic interventions in res olving crisis resulting fromfamily transitional difficulty, chronic illness, divorce, separation, remarriage, death.

## Coun 580 -Supervision (1)

Presents a systemic model of clinical supervision and its application to the supervisory process. Relationship of the model to existing conceptual and empirical literature also overviewed. Techniques and skills for debriefing and mentoring supervisees also addressed.

## Coun 581 -Multicultural Perspectives in Counseling (3)

A study of the human, ecological and societal forces influencing the provis ion of counseling services to culturally diverse students and other clients in educational and community settings. Current is sues, problems and trends will be examined. Increased competence in individual and group counseling strategies and techniques will be emphasized, using didactic and experiential approaches.

Prerequisite: Coun 541.

## Coun 582 - Research and ProgramEvaluation in Counseling (3)

Covers the areas of research design, basic psychometric principles and statistical procedures, test/scale construction, needs assessment, programevaluation, use of library as a research tool, and writing research reports. Specific counseling applications to community, rehabilitation, and school settings are made.

## Coun 583 - Job Placement and Development (3)

Designed to provide students with a solid understanding of job placement principles, practice and knowledge needed to assist people with disabilities in securing and
maintaining employment, and job development and marketing techniques required for seeking both competitive and supported employment.

## Coun 584 - Crisis Assessment and Intervention (1)

Designed to providestudents with knowledge and skills in cris is assessment and intervention in a variety of settings. Course content includes the types of cris is situations many counselors experience, including suicidal clients, clients who are victims of abuse or neglect, and potentially homicidal clients. Students will learn and practice strategies for as sessing risk level, minimizing potential liability, and promoting client safety.

## Coun 585 - Diagnosis and Treatment Planning I (3)

First in a sequence of two courses introducing students to the diagnosis and treatment of ps ychiatric disorders as outlined in the current Diagnostic and Statistical Manual of Mental Dis orders. Emphas is on diagnostic reasoning, basic map and thinking process embedded in the current Manual. Use of decision trees to arrive at accurate diagnoses. Overview of conditions covered in the Manual.

Prerequisite: Coun 541.

## Coun 586 - Psychopharmacology and Mental Illness (3)

Examines important psychotropic medications and their therapeutic applications. Drug efficacy, side effects, treatment of specific disorders such as anxiety and mood disorders, psychoactive substance use dis orders, and schizophrenia.
Prerequisite: Coun 541.

## Coun 587 - Foundations of Mental Health Services (3)

Examines community mental health movement, policy, service sequence, and related legislation; organization and delivery of mentalhealth services at the federal, state, and local levels; influences and trends in service delivery.

Prerequis ite: Coun 541.

## Coun 588 - Diagnosis and Treatment Planning II (3)

Second in a sequence of two courses that examine the diagnosis and treatment of mental dis orders, as outlined in the current Diagnostic and Statistical Manual.

## Coun 589 - Action Research in Counseling (1-2)

Designed to enable school counselors to conduct action research projects which align with school goals and CGCP standards and objectives. Students learn about action research methods, literature reviews, needs assessments, and guidance interventions. Students develop a research
proposal, conduct the research, analyze data, and disseminate results through a formal report. Two credits in Fall term, One in Winter, Two in Spring.

## Coun 590 - Foundation of Rehabilitation Counseling (3)

Introductory course for students pursuing graduate study in rehabilitation counseling and is also oriented toward students with a more peripheral interest in related human service fields. Intended to provide a broad overview of the profes sion of rehabilitation counseling with an emphasis on both theoretical and practical as pects of the field.
Prerequisite: Psy 534 or Coun 541.

## Coun 591 -Medical Aspects of Disability (3)

Covers the mostcommon physical, sensory, and mental dis abilities encountered by the rehabilitation professional. The major symptomatology, diagnostic procedures, treatment modalities, functional implications, and psychosocial and vocational correlates of each dis abling condition will be discussed.
Prerequisite: Coun 590.

## Coun 592 - Psychosocial Aspects of Disability (3)

Covers the psychological and social as pects of adjustment and adaptation to a variety of dis abling conditions. Theoretical and practical is sues relating to various types of physical, psychiatric, mental and social disabilities will be examined and discussed.

Prerequisite: Coun 590.

## Coun 593 - Case Management (3)

Students will study case management systems and skills as used in both public and private rehabilitation and related other human service agencies. Topics covered include case identification, referral, eligibility determination, as sessment, goal setting, plan development, intervention strategies, case monitoring, inter-agency coordination, advocacy, promotion of self-advocacy by client, software systems, information flow, org anizational structures, time management, critical case management skills, funding sources and billing, as well as other topics of interest to the student.

Prerequisite: Coun 590.

## Coun 594-Occupational Analysis/Vocational Evaluation (3)

Content and experiences presented through this course are design to familiarize the student with the basic principles and imperatives of occupational analysis and vocational evaluation and how these are applied and used in real world settings. Didactic instruction, experiential research, and collegial participation will be used to help students integrate course teachings into a core of pers onal and
professional understanding which can then be applied to many different settings or systems.

Prerequisite: Coun 590.
Coun 595 - Contemporary Issues andApplications in Rehabilitation Counseling (3)

Covers contemporary is sues in the field of rehabilitation counseling as well as recent applications of rehabilitation theories, technologies, assessment procedures, and counseling modalities, to a variety of rehabilitation settings and across rehabilitation populations.

## Coun 596 - Foundations of School Counseling (3)

Foundational course for students pursuing graduate study in the specialized field of school counseling. Intended to provide a broad overview of the school counseling profession with an emphasis on both theoretical and practical as pects of comprehensive school counseling programs. Field study required.

## Coun 597 -Strengths, Risk Factors, andDisturbance in Infants, Toddlers, and Their Families (3)

Focus on infants, toddlers, and their families and how they cope successfully with life tasks andexternal stressors. Examination of what happens when coping breaks down and problems emerge in families with young children. Students will (1) identify relevant strengths and resiliency factors for infants, toddlers, and their families; (2) understand developmentally relevant risk factors, especially parental mentalhealth is sues, and their potential impact on infants, toddlers, and their families; and (3) gain knowledge of major forms of psychopathology within infant/toddlermental health.

Coun 601 - Research (1-9)
(Credit to be arranged.)

## Coun 602 - Independent Study (1-9)

(Credit to be arranged.)

## Coun 603 - Dissertation (1-9)

(Credit to be arranged.)

## Coun 604 - Cooperative Education/Internship (1-9)

(Credit to be arranged.)

## Coun 605 -Reading and Conference (1-9)

(Credit to be arranged.)

## Coun 606 -Special Problems/Projects (1-9)

(Credit to be arranged.)

## Coun 607 -Seminar (1-9)

(Credit to be arranged.)

## Coun 608-Workshop(1-9)

(Credit to be arranged.)

## Coun 609 -Practicum(1-9)

(Credit to be arranged.)

## Coun 610 -Selected Topics (1-9)

(Credit to be arranged.)

## Coun 801 - Research (0-9)

(Credit to be arranged.)

## Coun 802 -Independent Study (0-9)

(Credit to be arranged.)

## Coun 804 -Cooperative Education/Internship (0-9)

(Credit to be arranged.)

## Coun 805 -Reading and Conference (0-9)

(Credit to be arranged.)

## Coun 806 -Special Problems (0-9)

(Credit to be arranged.)

## Coun 807 -Seminar (0-9)

(Credit to be arranged.)

Coun 808 - Workshop(0-9)
(Credit to be arranged.)

Coun 809 - Practicum(0-9)
(Credit to be arranged.)

Coun 810 - Experimental Course (0-9)
(Credit to be arranged.)

## CPH - Community \& Public Health

Courses offered as part of the joint OHSU-PSU School of Public Health.

## CPH 511 - Research Methods and Evidence-based Practice (3)

The purpose of this course is to enhance students' abilities to comprehend critique and apply research methodology and research-based evidence. Students will locate and critically evaluate evidence generated fromquantitative, qualitative, andepidemiological methods, with particular attention paid to statistical significance and clinically meaningful outcomes. Students will trans form their own clinical inquisitiveness into practice-based researchable questions and focus on the application of research methods in clinical settings. Students will also gain experience in using publicly available databases and displaying data in a variety of formats.
Also offered as CPH 611. Prerequis ite: Statistics.
CPH 515 -Geographic Information Systems for Public Health (3)
Public health practitioners track population data to plot disease trends and associated patterns of social and biological determinants of health dis parities. This course will coverconcepts of basic mapping using Geographic Information System(GIS) software. Types and sources of data will be reviewed, along with their uses for understanding demographic and socioeconomic trends. This is an asynchronous, online "lab" course based on tutorials and case studies. Students interested in a strong understanding of underly ing GIS principles should consider GEOG 588 instead of this course.
Also offered as CPH 615 for doctoral students.
CPH 521 -Social Determinants of Health (3)
How do socioeconomic conditions "getunder our skin"? Why and how socioeconomic inequalities translate into biological outcomes thus shaping health inequalities? What are the drivers of population health and what can we do
about it? Such questions are analyzed and debated in this online course. The aim of this course is to comprehend theories, methods and evidence regarding the powerful influence of social and economic factors on public health. This introductory-level course aspires that students trans late academic contents into public health practice. To that end, students will make readings about the social determinants of health, and will apply its contents to a chosen population to see first-hand how the social determinants affect the health of a chosen population. This assessment could lay the basics for culturally and economically congruent interventions/policies to mitigate health problems.

## Also offered as CPH 621.

## CPH 522 - Communicating Public Health Data (3)

Traditionally, public health findings and surveillance data are dis seminated through publications and reports designed for the academic and scientific community. Today, with growing access to public health data for the general population, there is also the increasing risk of data being mis understood, misused or poorly interpreted. Thus we have a significantrole in synthesizing, interpreting and presenting data in ways that nonscientific audiences can understand and use. The purpose of this course is to explore public health surveillance systems; retrieve and analyze data for health disparities and inequities, and develop communication approaches regarding the findings for: the community at risk, the general public, policy makers, and the press. Principles of communicating scientific data to lay audiences and the concept of "place based approaches" as effective framing language will be explored. The strengths and limitations of various data presentation formats will be tested as students research different audiences and determine what data to use, the key messages, and how to present the data effectively.

Also offered as CPH 622 for doctoral credit.
CPH 523 - Primary Health Care and Health Disparities: Global Perspectives and Program Development (3)
This online course will examine the contextual factors of primary health care and global health disparities. Current trends in global health will be described and discussed utilizing research, best practices, international guidelines, and expert opinion. Students will gain a broadened perspective on the impact of primary care interventions in international venues. Students will develop an increased understanding of the complexities associated with global health dis parities, interventions and relief efforts, and development.

Also offered as CPH 623.

## CPH 526 - Epidemiology of Aging \& Chronic Disease (3)

This course introduces the application of epidemiologic methods to the study of older persons and chronic disease. The course will examine concepts and topics including trends in aging and the health of aging populations; health transition, and explanations and consequences of mortality decline; determinants of health and survival; distinctions between normal aging, disease and disability; health promotion and primary, secondary, and tertiary prevention, as applied to older persons; the epidemiology of selected diseases; syndromes and conditions common to older age and chronic illness.
Also offered as CPH 626.

## CPH 528 - Management Practice and Quality Improvement in Health Care and Public Health Organizations (3)

Introduction to leadership and management, focusing on effective strategies for creating a productive work environment through techniques like conflict resolution, building collaborative teams, and providing team leadership. Issues of measuring, managing and improving the quality of health care will also be addressed. Current national efforts in performance measures in public health (ie.,county certification) are discussed. Case studies taken from public health departments and other settings will be used to master problem-solving methods.

## Also offered as CPH 628.

## CPH 530 - Introduction to Biostatistics (4)

This course covers a broad range of statistical methods used in the health sciences. Although statistical methodology will be presented to the extent needed for students to understand the models and methods, the course will emphasize practical applications over theoretical derivations. Students will learn how to use a computer package for data analysis, and how to interpret the results of data analyses. Homework assignments and exams will address conceptual, methodological and data analytic is sues.
Also offered as CPH 630.
CPH 531 - Social Context of Public Health Policy (3)
Public health ethics is a weighing and balancing of the needs of the community with the rights of the individual. Therefore, this course will involve both intra-reflective and interreflective examination of the social and structural inequalities and injustices within our society, locally and globally, and how they affect policy and ethical practice in public health. The relationship of human rights to health and how human rights cut across law, ethics, policies, and advocacy in public health is examined. The role of a human rights perspective will also be addressed as an important part of international health practice.

## Also offered as CPH 631.

## CPH 535 - Professionalism, Ethics \& Systems Thinking in Public Health (3)

This course presents several key theoretical principles and practices of public health. Using a case-based format, the course will examine six competencies of public health AttachmentE. 2 p. 1 of 3 practice identified by the Academic Council on Linkages including familiarity with the Core Functions and Essential Services of public health; facility in grant-writing; the relationship of the legal and political systems to public health; interpretation of public health data for public use; pitfalls of policy-making; and the ethics of public health practice and study design. Indepth examination of these is sues will prepare the student for leadership roles in community and in public health.

Also offered as CPH 635.
CPH 536 - Community BasedParticipatory Research (3)

This course examines Community-BasedParticipatory Research (CBPR) as a research paradigmto understand and address health disparities at the community level. Review of operating principles includes the central place that communities are accorded as units of identity and as co-equals in research, a process that is perceived by community constituents as not dominated by elitists, an emphasis on long-termcommitment by all partners, emphasis on co-learning so that the process flows back and forth, use of exercises that stimulate collective visioning among all partners, incorporation of social ecology approaches as departures for research and practice, use of innovative problemsolving approaches and use of multiple methods of data collection. Topics include community theory, development strategies, promising interventions, group development techniques, community diagnosis, and capacity assessments.
Also offered as CPH 636.

## CPH 537 - Principles of Health Behavior (3)

This overview course is designed to provide students with basic information concerning the interaction of biological, psychological, behavioral, sociocultural, and environmental processes that function in the promotion of health and prevention of disease. Theories developed to explain health and illness behaviors at the intrapersonal, interpersonal, and group/community levels are introduced and critiqued. Ethical considerations inherent to efforts designed to produce health-related behavior change are examined.
Also offered as CPH 637.
CPH 538 - Public Health ProgramEvaluation (3)
Using case study methodology, this course focuses on the acquisition of technical skills in design, data collection and
analys is for the purpose of evaluating public health programs. Programjustification and evaluation for policymaking purposes will be emphasized. In addition, alternative forms of evaluation will be examined including rapid as sessment, participatory evaluation and historical, social net working and other techniques. Students will have the opportunity to examine public health data sets and to design an evaluation focused on a disparate population as well as develop policy based on critical analysis of several types of evaluations.
Also offered as CPH 638. Prerequisite: CPH 550.

## CPH 539-Concepts of Environmental Health (3)

This course is designed to introduce graduate students in the MPH degree programs of the OHSU-PSU School of Public Health to the fundamental concepts of theory and practice in environmental public health. Students will become familiar with principles of hazard identification, exposure as sessment, toxicology, epidemiology, intervention, and policy and regulation. Application of concepts will be illustrated in a wide variety of agents and diseases, ranging fromtoxic air pollutants, pesticides, noise and ionizing radiation, to the emerging is sues of endocrine dis ruptors, climate change, and the built environment.
Also offered as CPH 639.

## CPH 550 - Public Health Program Planning (3)

This course provides an introduction to programplanning and experience in the grant writing process, with an emphas is on public health intervention programs. Students will be introduced to programplanning, with an emphasis on logic models. Students will be introduced to the key areas of a proposal that must be addressed in grant writing.
Also offered as CPH 650.

## CPH 611 - Research Methods and Evidence-based

 Practice (3)The purpose of this course is to enhance students' abilities to comprehend critique and apply research methodology and research-based evidence. Students will locate and critically evaluate evidence generated fromquantitative, qualitative, and epidemiological methods, with particular attention paid to statistical signific ance and clinically meaningful outcomes. Students will transform their own clinical inquisitiveness into practice-based res earchable questions and focus on the application of research methods in clinical settings. Students will also gain experience in using publicly available databases and displaying data in a variety of formats.
Also offered as CPH 511. Prerequisite: Statistics.

## CPH 615 - Geographic Information Systems for Public Health (3)

Public health practitioners track population data to plot diseasetrends and associated patterns of social and biologicaldeterminants of health dis parities. This course will cover concepts of basic mapping using Geographic Information System(GIS) software. Types and sources of data will be reviewed, along with theiruses for understanding demographic and socioeconomic trends. This is an asynchronous, online "lab" course basedon tutorials and case studies. Students interested in a strong understanding of underly ing GIS principles should consider GEOG 588 instead of this course.
Also offered for graduate-level credit as CPH 515.

## CPH 621 -Social Determinants of Health (4)

How do socioeconomic conditions "getunder our skin"? Why and how socioeconomic inequalities translate into biologicaloutcomes thus shaping health inequalities? What are the drivers of population health and what can we do about it? Such questions are analyzed and debated in this online course.
The aim of this course is to comprehend theories, methods and evidence regarding the powerful influence of social and economic factors on public health. This introductorylevel course aspires that students translate academic contents into public health practice. To that end, students will make readings about the social determinants of health, and will apply its contents to a chosen population to see first-hand how the social determinants affect the health of a chosen population. This assessment could lay the basics for culturally and economically congruent interventions/policies to mitigate health problems.
Also offered as CPH 521.

## CPH 622 - Communicating Public Health Data (3)

Traditionally, public health findings and surveillancedata are disseminated through publications and reports designed for the academic and scientific community. Today, with growing access to public health data for the general population, there is also the increasing risk of data being misunderstood, misused or poorly interpreted. Thus we have a significant role in synthesizing, interpreting and presenting data in ways that nonscientific audiences can understand and use. The purpose of this course is to explore public health surveillance systems; retrieve and analyze data for health disparities and inequities, and develop communication approaches regarding the findings for: the community at risk, the general public, policy makers, and the press. Principles of communicating scientific data to lay audiences and the concept of "place based approaches" as effective framing language will be explored. The strengths and limitations of various data presentation formats will be tested as students research different audiences and determine what data to use, the key messages, and how to present the data effectively.

Also offered for graduate-level credit as CPH 522.

## CPH 623 - Primary Health Care and Health Disparities: Global Perspectives and Program Development (3)

This online course will examine the contextual factors of primary health care and global health disparities. Current trends in global health will be described and discussed utilizing research, best practices, international guidelines, and expert opinion. Students will gain a broadened perspective on the impact of primary care interventions in international venues. Students will develop an increased understanding of the complexities associated with global health disparities, interventions and reliefefforts, and development.
Also offered as CPH 523.

## CPH 626 - Epidemiology of Aging \& Chronic Disease

 (3)This course introduces the application of epidemiologic methods to the study of older persons and chronic disease. The course will examine concepts and topics including trends in aging and the health of aging populations; health transition, and explanations and consequences of mortality decline; determinants of health and survival; distinctions between normal aging, disease and disability; health promotion and primary, secondary, and tertiary prevention, as applied to older persons; the epidemiology of selected diseases; syndromes and conditions common to older age and chronic illness.

Also offered as CPH 526.

## CPH 628 - Management Practice and Quality Improvement in Health Care and Public Health Organizations (3)

Introduction to leadership and management, focusing on effective strategies for creating a productive work environmentthrough techniques like conflict res olution, building collaborative teams, and providing team leadership. Issues of measuring, managing and improving the quality of health care will also be addressed. Current national efforts in performance meas ures in public health (ie., county certification) are discussed. Case studies taken from public health departments and other settings will be used to master problem-solving methods.
Also offered as CPH 528.

## CPH 630 - Introduction to Biostatistics (4)

This course covers a broad range of statistical methods used in the health sciences. Although statistical methodology will be presented to the extent needed for students to understand the models and methods, the course will emphasize practical applications over theoretical derivations. Students will learn how to use a computer package for data analysis, and how to interpret the results
of data analyses. Homework as signments and exams will address conceptual, methodological and data analytic is sues.

## Also offered as CPH 530.

## CPH 631 -Social Context of Public Health Policy (3)

Public health ethics is a weighing and balancing of the needs of the community with the rights of the individual. Therefore, this course will involve both intra-reflective and interreflective examination of the social and structural inequalities and injustices within our society, locally and globally, and how they affect policy and ethical practice in public health. The relationship of human rights to health and how human rights cut across law, ethics, policies, and advocacy in public health is examined. The role of a human rights perspective will also be addressed as an important part of internationalhealth practice.
Also offered as CPH 531.

## CPH 635 - Professionalism, Ethics \& Systems Thinking in Public Health (3)

This course presents several key theoretical principles and practices of public health. Using a case-based format, the course will examine six competencies of public health practice identified by the Academic Council on Linkages including familiarity with the Core Functions and Es sential Services of public health; facility in grant-writing; the relationship of the legal and political systems to public health; interpretation of public health data for public use; pitfalls of policy-making; and theethics of public health practice and study design. In-depth examination of these is sues will prepare the student for leadership roles in community and in public health.
Also offered as CPH 535.

## CPH 636 - Community BasedParticipatory Research

 (3)This course examines Community-Based Participatory Research (CBPR) as a research paradigmto understand and address health disparities at the community level. Review of operating principles includes the central place that communities are accorded as units of identity and as co-equals in research, a process that is perceived by community constituents as not dominated by elitists, an emphasis on long-termcommitment by all partners, emphasis on co-learning so that the process flows back and forth, use of exercises that stimulate collective visioning among all partners, incorporation of social ecology approaches as departures for research and practice, useof innovative problemsolving approaches and use of multiple methods of data collection. Topics include community theory, development strategies, promising interventions, group development techniques, community diagnosis, and capacity assessments.
Also offered as CPH 536.

## CPH 637 - Principles of Health Behavior (3)

This overview course is designed to provide students with basic information concerning the interaction of biological, psychological, behavioral, sociocultural, and environmental processes that function in the promotion of health and prevention of disease. Theories developed to explain health and illness behaviors at the intrapersonal, interpersonal, and group/community levels are introduced and critiqued. Ethical considerations inherent to efforts designed to produce health-related behavior change are examined.
Also offered as CPH 537.
CPH 638 - Public Health ProgramEvaluation (3)
Using case study methodology, this course focuses on the acquis ition of technical skills in design, data collection and analys is for the purpose of evaluating public health programs. Programjustification and evaluation for policymaking purposes will be emphasized. In addition, alternative forms of evaluation will be examined including rapid as sessment, participatory evaluation and historical, social net working and other techniques. Students will have the opportunity to examine public health data sets and to design an evaluation focused on a dis parate population as well as develop policy based on critical analysis of several types of evaluations.

## Also offered as CPH 538.

## CPH 639 - Concepts of Environmental Health (3)

This course is designed to introduce graduate students in the MPH degree programs of the OHSU-PSU School of Public Health to the fundamental concepts of theory and practice in environmental public health. Students will become familiar with principles of hazard identification, exposure as sessment, toxicology, epidemiology, intervention, and policy and regulation. Application of concepts will be illustrated in a wide variety of agents and diseases, ranging fromtoxic air pollutants, pesticides, noise and ionizing radiation, to the emerging issues of endocrine dis ruptors, climate change, and the built environment.

Corequisite: Als o offered as CPH 539.

## CPH 650 - Public Health Program Planning (3)

This course provides an introduction to programplanning and experience in the grant writing process, with an emphas is on public health intervention programs. Students will be introduced to programplanning, with an emphasis on logic models. Students will be introduced to the key areas of a proposal that must be addressed in grant writing.
Also offered as CPH 550.

## CR - Conflict Resolution

## CR 101 - Nonviolent Interaction (2)

Offers students a basic framework for transforming human interactions, es pecially social discourse and communication, from"calling out" to "calling in." Covers techniques developed by nonviolentactionists, psychologists, and communication theorists to help humankind evolve past destructive communication toward constructive interactions.

## CR 199 - Special Studies (1-8)

(Credit to be arranged.)

## CR 201 -Social Movement Messaging (2)

Grassroots politics at every level fromcommunity to county to state to national and transnational are successful or not in large part due to the quality of mes saging. Using interd is ciplinary principles fromConflict Resolution, Communications, Psychology, and Writing (English), students develop frameworks and mes saging techniques to advance campaign goals by affecting influencers.

## CR 299 - Special Studies (1-5)

(Credit to be arranged.)

## CR 301U - Introduction to Conflict Resolution (4)

Introduces conflict resolution studies. Explores both the nature of conflict and our understanding of what resolution seeks to achieve. Emphasizes strategies students currently employ toward resolving conflict in their own lives, with suggestions and examples that broaden their understanding of what is possible. Small groups, simulated conflict situations, role plays, and examples from community service provide students with the opportunity to both better understand their own strategies and develop new ones.

## CR 302U- Peace Studies (4)

This introductory course explores the general questions of war and peace with units on history of peace, nonviolent conflict resolution, religious and philosophical peace orientations, costs and benefits of war and peace, laws of war and peace, selected peace leader biographies.

## CR 303U- Consensus Building (4)

Competency development in seeking, building, and achieving consensus decisions in org anizations and
community coalitions. How to achieve community betterment using consensus organizing practices.

## CR 304U - Participating in Democracy (4)

When individuals, groups, or coalitions want policy change they are not limited to simply voting. This course explores the many ways to work in a democracy even for people unable to vote (too young, non-citizens, purged fromrolls for any reason). Looks at case studies of grassroots leading elected officials.

## CR 305U - Ecology of War and Peace (4)

Looks at environmental effects of waging and preparing to wage war, natural resource drivers to war, and what an ecology of peace would look like and what it would accomplish. Conceptually, what is a more thorough and accurate cost-benefit analy sis of methods of nation-state conflict management, using the US as the case example.

## CR 306U - Nonviolence: History and Campaign Design (4)

This course examines nonviolence fromseveral perspectives, including units on philosophical and religious nonviolence, nonviolent communication, nonviolent response to personal attack, Gandhian nonviolence, Sharp strategic nonviolence, and the emergent field of nonviolent conflict forensics.

## CR 307 - Conflict Management Skills (4)

Interactive survey of practical array of conflict management competencies with units on facilitation, consensus building, mediation, conflict analysis, conflict mapping, de-escalation, negotiation, conflict management systemdesign, community organizing, conflict management careers. Theory, simulations, and student teampresentations generate new competencies and evaluativeopportunities.

## CR 310U - Conflict Resolution Values \& Ethics (4)

Undergraduate introduction to the study of foundational concepts in the field of conflict resolution. The course also introduces the impact that conflict resolution practice may have on the critique and construction of theory. Profess ional ethical is sues and other dilemmas in conflict resolution practice are also studied.

## CR 311U - Conflict Resolution Psychology (4)

Introduction to the psychological research and insights that illuminate conflict resolution theory and practice. A dual focus on both methods and research.

## CR 312 - Intercultural Conflict Resolution (4)

Intercultural conflict res olution explored through intercultural communication theory, and through study of its relationship to processes of conflict and outcomes of res olution. Considers how intercultural conflict res olution operates within our selves, among our selves, and in the personal, professional, and world-at-large through dialogue, interaction, and the creative arts.

## CR 313 - Environmental Conflict Resolution (4)

Critically examines conflict resolution principles and practices as applied to environmental conflicts. Explores the conflict between the duty to protect theenvironment ag ainst promoting economic well-being for humanity. Examines conflict resolution theory and practice in terms of case studies of environmental conflict, locally, nationally, and globally.

## CR 314 - Introduction to Restorative Justice (4)

Defines restorative justice and differentiates from restorative practices. Explores restorative justice options in the justice systemat juvenile and adult levels; and evaluates restorative practices in schools.

## CR 315 - Divided America (4)

Through case studies drawn fromUS culture and politics, students will learn how conflict res olution strategies can soften divisions between people and gain allies for social betterment and moral improvement.

## CR 399 - Special Studies (1-5)

(Credit to be arranged.)

## CR 402 - Independent Study (1-12)

(Credit to be arranged.)

## CR 405 - Reading and Conference (1-12)

(Credit to be arranged.)

## CR 406 - Special Projects (1-8)

(Credit to be arranged.)

## CR 407 -Seminar (1-5)

(Credit to be arranged.)

CR 408 - Workshop(1-12)
(Credit to be arranged.)

CR 409 - Practicum (1-12)
(Credit to be arranged.)

CR 410 -Selected Topics (1-5)
(Credit to be arranged.)

## CR 411 - Conflict Resolution Career Preparation (4)

Community based learning of variety and breadth of conflict transformation and peacebuilding through a combination of visits, field experience and project work. Development of reflective practice habits through online seminar discussion.

Prerequisite: CR 301U, CR 307 (for majors only).

## CR 416 - Evil and Hate (4)

Explores the breakdown in dialogue surrounding the stereotyping and dehumanization of those who we view as "evil doers." Challenges unreflective use the terms, "hatred" and "evil" in political rhetoric, creating a dangerous "us and them" dichotomy, and making reconciliation across cultures and viewpoints nearly impossible.
Also offered for graduate-levelcredit as CR 516 and may be taken only once for credit.
CR 419 - Forgiveness and Atonement (4)
Explores both the theoretical and practical advantages and difficulties with forgiveness and atonement. Emphasis on how forgiveness and atonement informconflict resolution practices.
Also offered for graduate-levelcredit as CR 519 and may be taken only once for credit.

## CR 420 - Individual and Group Reconciliation Processes (4)

Explores various dimensions involved in the process of reconciliation between individuals, groups and societies.

Topics covered include the evolution of historical wounds, memory, accountability, acknowledgment, restitution, forgiveness and truth. Case studies provide a focal point for class discussions and analysis.
Also offered for graduate-level credit as CR520 and may be taken only onceforcredit. .Prerequisite: upper-division standing and CR 301U.

## CR 423 - Dialogue Across Differences (4)

An exploration of the theory and practice of dialogue to address conflict. Dialogue includes intention, purpose, process dimensions and outcomes and is utilized in various dimens ions of peace and conflict res olution efforts. Dialogue crosses disciplines, creating a common thread through the many dimensions of peace work.

Also offered for graduate-level credit as CR523 and may be taken only onceforcredit. .Prerequisite: upper-division standing.

## CR 427 - Nationalism and Ethnic Conflict (4)

Interdisciplinary inquiry into leading perspectives and theories of nationalism. Examined as a determinant factor of international and interethnic conflict. Analyzed through multiple case-specific conflict phenomena. Assessed in terms of its his torical roots, evolution, structural patterns and socio-political antecedents and consequences.
Also offered for graduate-level credit as CR 527 and may be taken only onceforcredit. . Prerequisite: Upperdivision standing.

## CR 428 - Human Values in War and Peace: Value Dilemmas, Contradictions and Resolutions (4)

Critically reflects on how similarly or differently values and belief systems function under conditions of war and peace. Explores value conflicts and possible resolutions, as well as how different approaches to values may be conducive to violent conflict or to empowering peace on the international stage.
Also offered for graduate-level credit as CR528 and may be taken only onceforcredit. .Prerequisite: upper-division standing.

## CR 429 - European Union as a Peacebuilding System (4)

Interdisciplinary focus on the European Union as an interand trans-national systemof conflict resolution and peace building. Examined by contrasting the nationalist conflicts of old Europe to post-war efforts in building a systemof peace and security that transcends belligerent ethnocentric nationalism.
Also offered for graduate-level credit as CR 529 and may be taken only oncefor credit. .Prerequisite: upper-division standing.

## CR 431 - Improvisational Conflict Resolution (2-4)

An experiential opportunity to learn and explore various dimensions of improv is ational techniques that are useful in conflict resolution settings. The class will use a variety of activities, techniques and exercises to develop improvisational skills and to assess the potency and application of these skills in professional contexts. No performance experience is expected or required - justan opportunity to learn, grow and improve your craft. Preparation in effectivecommunication and analyzing complex materials is expected. This course may not be repeated forcredit.
Also offered for graduate-level credit as CR 531 and may not be repeated for credit. Prerequisite: Upper-division standing.

## CR 432 - Power and Conflict Resolution (2-4)

The dynamics of power and status within conflict scenarios. Analysis of phenomena at the micro (interpers onal, intergroup) and macro (social, political) dimensions of these issues. Relationship to issues of gender, race, culture, leadership and other areas where the phenomena of power and status are at play. Students receive theoretical and practical grounding in these concepts. Course involves reading and writing as well as role plays and simulations. Preparation in communication skills and analysis of complexphenomena expected. This course may not be repeated for credit.

Also offered for graduate-level credits as CR 532 and may not be repeated for credit. Prerequisite: Upper-division standing.

## CR 433 - Love and Conflict Resolution (2-4)

Exploration of love as an important basis of encouraging engagement, fostering connection, and brid ging the differences that are inevitable in our relationships. An understanding of the richness of this kind of love will both expand our perceptions of the complexities of conflict, and provide concrete tools to resolve and transform conflict personally, academically, and professionally. This course may not be repeated for credit.

Also offered for graduate-level credit as CR 533 and may not be repeated for credit. Prerequisite: CR 301U.

## CR 439 - Family Mediation (2)

In cases of divorce and custody Oregon State Law encourages/mandates the use of mediation. Particular concerns around power balancing, domestic violence, child-focused parenting, and other family is sues will be explored. Specific training and ethical standards will be evaluated in relationship to the general practice of mediation.

Also offered for graduate-level credit as CR539 and may be taken only oncefor credit. . Prerequisite: upper-division standing.

## CR 440 - Peer Mediation (2)

Overview of programs in the schools where youth serve as mediators to res olveconflict between other students. Focus will be on successes and challenges as well as other approaches schools undertake to respond to student conflict. Opportunity to practice conflict res olution skills and analyze conflict dynamics of race and oppression.

Also offered for graduate-level credit as CR540 and may be taken only onceforcredit. .Prerequisite: upper-division standing.

## CR 441 - Storytelling and Conflict Resolution (4)

Storytelling plays a role in limiting, creating and sustaining creative conflict res olution. Critical thinking and deliberate analys is used to deconstruct the grand narratives of dominant discourse, explore counter narratives emerging from the margins, and examine how res olution - and social change - has surfaced as a result.
Also offered for graduate-level credit as CR541 and may be taken only once for credit. .Prerequisite: upper-division standing.

## CR 442 - Peace Education (4)

A theoretical and practical introduction to the field of Peace Education. Explores the philosophical, cultural, pedagogical and curricular elements of Peace Education. Develops understanding of the theory and practice of effective conflict res olution education.
Also offered for graduate-level credit as CR542 and may be taken only oncefor credit. . Prerequisite: upper-division standing.

## CR 443 - Nationalism versus Democracy since 9/11 (4)

Examines the rise of American nationalismin the aftermath of $9 / 11$ and its impact on America's relationship to the world. Nationalist and democratic ideologies are examined from a peace and conflict studies perspective, with attention to implications for war and peace. Special focus on political and ideological shifts since 2016.

Also offered for graduate-level credit as CR 543 and may be taken only onceforcredit. . Prerequisite: upper-division standing.

## CR 444 - Neighbors and Enemies: Cyprus, Greece and Turkey (4)

Focuses on the protracted ethno-nationalist conflict in Cyprus and Greek-Turkish relations. The Cyprus problem is investigated as a case study in nationalist conflict in the context of domestic, regional and international conflict dynamics. Trends toward conflict de-escalation and reconciliation in the context of the EU are also studied.

Also offered for graduate-level credit as CR 544 and may be taken only once for credit. . Prerequisite: upper-division standing.

## CR 445 - Gender and Conflict Resolution (4)

Explores the social construction of gender and its impact on conflict. Psychologicaltheories, violence and aggression, communication styles, culture, societal structures, conflict resolution paradigms and war and peacebuilding are analyzed. Examines micro and macro is sues connected to gender, peace, conflict and violence.

Also offered for graduate-level credit as CR 545 and may be taken only once forcredit. . Prerequisite: upper-division standing.

## CR 446 - Human Rights and Conflict Resolution (4)

Key actors and core elements to promoting human rights as a conflict resolution mechanism around the world.
Also offered for graduate-level credit as CR 546 and may be taken only once for credit. Prerequisite: Upper-division standing.

## CR 447-Civil Society and Conflict Resolution (4)

Explores the multi-faceted conflict res olution roles of civil society and non-governmentalactors in helping societies experiencing strife, rebuild, manage and prevent conflict.

Also offered for graduate-level credit as CR 547 and may be taken only once for credit. Prerequisite: Upper-division standing.

## CR 448 - Transitional Justice and Peacebuilding (4)

Transitional justice as legal and non-legal initiatives to bring closure, healing, and reconciliation after tragedies.
Also offered for graduate-level credit as CR 548 and may be taken only once for credit. Prerequis ite: Uppderdivision standing.

## CR 449 - Intro to Holocaust and Genocide Studies (4)

Introduction to Holocaust and Genocide Studies presents the historical context of the Holocaust, including timelines and events, as a means to understand how the definitions and understandings of genocide and atrocity have developed in response. Diverse stories of subsequent atrocities will be presented, and students will have the opportunity to draw parallels between the past and current events in the world, enhancing a robust and complex understanding of genocide. We will focus on genocide prevention, offering models of successful prevention noting key precursors to genocide/atrocities.

Also offered for graduate-level credit as CR 549 and may be taken only once for credit. Prerequisite: CR 301U, Hst 380U, JSt 380U, or BSt 214.

## CR 451 - Conflict Analysis andStrategic Mediation (4)

Surveys international dis putes through a conflict transformation lens. Topics drawn fromdivers e conflicts world-wide, including international models and national policies. Case studies will be examined and developed in order to build skills for diagnosing conflict and for developing actionable strategies for peace building.

Also offered for graduate-level credit as CR551 and may be taken only onceforcredit. Prerequisite: CR 301U.

## CR 452 - Technology and Global Affairs: A Peace and Conflict Studies Perspective (4)

Hi-tech organizations, their instruments, their power, and mode of operation, in both the public and private sector, will be analyzed fromthe vantage point of how they contribute globally to peace and security and/or to polarizations and conflict. Topics include: technology and globalization; digital economies; hi-tech organizations; post-truth in social media; challenges to democracy; the surveillance state; the surveillance corporation; national security and citizen rights; cyber wars; cyber peace.

Also offered for graduate-level credit as CR 552 and may be taken only oncefor credit. Prerequisite: CR 301U.
CR 501 - Research (1-9)
(Credit to be arranged.)

## CR 502 - Independent Study (1-6)

(Credit to be arranged.)

## CR 503 - Thesis (1-12)

(Credit to be arranged.)

CR 504 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

## CR 505 - Reading and Conference (1-8)

(Credit to be arranged.)

## CR 506 -Special Projects (1-9)

(Credit to be arranged.)

CR 507 -Seminar (1-8)
(Credit to be arranged.)

## CR 508 - Workshop (1-12)

(Credit to be arranged.)

## CR 509 - Practicum(1-9)

(Credit to be arranged.)

## CR 510 - Selected Topics (1-4)

(Credit to be arranged.)

## CR 511 - Research Methods in Conflict Resolution (4)

Introduction to academic and applied research, and specifically research within the interdisciplinary field of Conflict Resolution. Students will develop literacy in reading and understanding research, and will gain experience collecting and evaluating data.

## Prerequisite: CR 512.

## CR 512 - Foundations of Conflict Resolution (4)

Introduction to full scope of the master's degree program, including advising and paths to degree. Students will survey models in the field of Conflict Resolution fromboth the humanities and social sciences. A particular focus will be given to the legal and ethical aspects of these models, along with a full exploration of legalities and professional ethics in conflict resolution practice. Expected preparation: 4 credits literature and 4 credits psychology or sociology.

## CR 513 - Advanced Values and Ethics in Conflict Resolution (4)

Exploration of values and ethics in the field of conflict resolution. The course also examines the impact of conflict res olution on theory and practical philosophy.

## CR 514 - Conflict Resolution in DivergentSettings (4)

Examination of the variety of settings where conflict resolution takes place. Guest speakers share their experience and theoretical insights.
Prerequisite: CR 512, 513.

## CR 515 - Negotiation (4)

Introduction to collaborative approaches to res ponding to conflict. A theoretical framework will be established for using negotiation and mediation in a variety of settings. Students will learn how to function as a neutral third party focusing on: conflict analysis, communication skills, maintaining a neutral role, creating a safe environment, and ensuring procedural, substantive and psychological
satisfaction. Ethical is sues and concerns in the field of mediation will be presented. Recommended prerequisite: 3 credits psychology or sociology.

## CR 516 - Evil and Hate (4)

Explores the breakdown in dialogue surrounding the stereotyping and dehumanization of those who we view as "evil doers." Challenges unreflective use the terms, "hatred" and "evil" in political rhetoric, creating a dangerous "us and them" dichotomy, and making reconciliation across cultures and viewpoints nearly impossible.
Also offered for undergraduate-levelcredit as CR416 and may be taken only once for credit.

## CR 517 - Nonviolence (4)

Designed to acquaint students with the theories and history of nonviolence from ancient times to the present, with some speculation as to future use. Recommended prerequisite: 3 credits of philos ophy.

## CR 518 - Psychology of Peace and Conflict (4)

Introduction to the psychological research and insights that illuminate conflict resolution theory and practice. A dual focus on both methods and research will be maintained throughout the curriculum. Expected preparation: 3 credits psychology.

## CR 519 - Forgiveness and Atonement (4)

Explores both the theoretical and practical advantages and difficulties with forgiveness and atonement. Emphasis on how forgiveness and atonement inform conflict res olution practices.
Also offered for undergraduate-level credit as CR419 and may be taken only once for credit.

## CR 520 - Individual and Group Reconciliation Processes (4)

Explores various dimensions involved in the process of reconciliation between individuals, groups and societies. Topics covered include the evolution of historical wounds, memory, accountability, acknowledgment, restitution, forgiveness and truth. Case studies provide a focal point for class discussions and analysis.
Also offered for undergraduate-levelcredit as CR420 and may be taken only once for credit.

CR 522 - Thesis and Project Preparation Seminar (4)
Introduction to the culminating requirement of the $C R$ graduate programdistinguishes between thetwo options:
thes is and project. Students discuss the different goals, activities, processes, and outcomes of the two options and review theses and projects written by predecessors.
Prerequisite: Admis sion to graduate program.

## CR 523 - Dialogue Across Differences (4)

An exploration of the theory and practice of dialogue to address conflict. Dialogue includes intention, purpose, process dimensions and outcomes and is utilized in various dimensions of peace and conflict resolution efforts. Dialogue crosses disciplines, creating a common thread through the many dimensions of peace work.

Also offered for undergraduate-level credit as CR423 and may be taken only once for credit. . Prerequis ite: upperdivision standing.

## CR 524 - Advanced Mediation (4)

Focus on the qualities of the practitioner that enhance the practice of mediation. The practice of mediation involves a particular kind of presence, that of a non-judgmental observer. To maintain such a presence while in the midst of emotions, intense interactions, hostility, and conflict requires much clarity, steadiness, and stability. Students will learn ways to achieve thesequalities through the cultivation of mindfulness. Recommended prerequisites: CR 515.

## CR 525 - Conflict Resolution Systems Design (4)

Acquaints thestudent with a systems approach to des igning conflict resolution services. These services are designed for a wide variety of settings to handle conflicts effectively at the lowest cost. Students learn to diagnose and correct problems in an existing system, as well as create and implement a wholly new system.

## CR 526 - Advanced Intercultural Conflict Resolution (4)

Explores the ways in which culturalsimilarities or difference might influence the conflict res olution process. In this context, culture is defined broadly and will be considered as it plays a part in either the actuality or perceptions of our experience. Is sues of power and marginality as they relate to dynamics of culture will be explored. Students explore and learn fromother cultures and apply this learning in the evaluation and use of conflict resolution paradigms.

## CR 527 - Nationalism and Ethnic Conflict (4)

Interdis ciplinary inquiry into leading perspectives and theories of nationalism. Examined as a determinant factor of international and interethnic conflict. Analy zed through
multiple case-specific conflict phenomena. Assessed in terms of its his torical roots, evolution, structural patterns and socio-political antecedents and consequences.
Also offered for undergraduate-levelcredit as CR 427 and may be taken only once for credit.

## CR 528 - Human Values in War and Peace: Value Dilemmas, Contradictions and Resolutions (4)

Critically reflects on how similarly or differently values and belief systems function under conditions of war and peace. Explores value conflicts and possible resolutions, as well as how different approaches to values may be conducive to violent conflict or to empowering peace on the international stage.
Also offered for undergraduate-levelcredit as CR428 and may be taken only once for credit. .

## CR 529 - European Union as a Peacebuilding System

 (4)Interdisciplinary focus on the European Union as an interand trans-national systemof conflict resolution and peace building. Examined by contrasting the nationalist conflicts of old Europe to post-war efforts in building a systemof peace and security that transcends belligerent ethnocentric nationalis $m$.

Also offered for undergraduate-levelcredit as CR429 and may be taken only once for credit. .

## CR 530 - Research and Professional Development Colloquium (1-4)

Graduate students meet in a collaborativeenvironment in order to learn from each other, fromfaculty members, from community partners, and fromother experts and practitioners in the field of conflict resolution. Each week, presentations, dialogue, and case exploration will offer real-time learning about current is sues in the discipline. Topics will include innovations in research, trends in the field, community activities, professionalization, and the many applied dimensions of conflict resolution, locally and globally.

## CR 531 - Improvisational Conflict Resolution (2-4)

An experientialopportunity to learn and explore various dimensions of improvisational techniques that are useful in conflict resolution settings. The class will use a variety of activities, techniques and exercises to develop improvisational skills and to assess the potency and application of these skills in professional contexts. No performance experience is expected or required - justan opportunity to learn, grow and improve your craft. Preparation in communication skills and the analysis of complex problems expected. This course may not be repeated for credit.

Also offered for undergraduate-level credit as CR431 and may not be repeated for credit.

## CR 532 - Power and Conflict Resolution (2-4)

The dynamics of power and status within conflict scenarios. Analysis of phenomena at the micro (interpersonal, intergroup) and macro (social, political) dimensions of these issues. Relationship to issues of gender, race, culture, leadership and other areas where the phenomena of power and status are at play. Students receive theoretical and practical grounding in these concepts. Preparation in communication skills and analysis of complex phenomenaexpected. This course may not be repeated for credit.
Also offered for undergraduate-level credit as CR432 and may not be repeated for credit.

## CR 533 -Love and Conflict Resolution (2-4)

Exploration of love as an important basis of encouraging engagement, fos tering connection, and brid ging the differences that are inevitable in our relationships. An understanding of the richness of this kind of love will both expand our perceptions of the complexities of conflict, and provide concrete tools to resolve and transform conflict personally, academically, and professionally. This course may not be repeated for credit.
Also offered for undergraduate-level credit as CR433 and may not be repeated for credit.

## CR 539 - Family Mediation (2)

In cases of divorce and custody Oregon State Law encourages/mandates the use of mediation. Particular concerns around power balancing, domestic violence, child-focused parenting, and other family is sues will be explored. Specific training and ethical standards will be evaluated in relationship to the general practice of mediation.
Also offered for undergraduate-level credit as CR439 and may be taken only once for credit. .

## CR 540 - Peer Mediation (2)

Overview of programs in the schools where youth serve as mediators to resolveconflict between other students. Focus will be on successes and challenges as well as other approaches schools undertake to respond to student conflict. Opportunity to practice conflict res olution skills and analyze conflict dynamics of race and oppression.

Also offered for undergraduate-level credit as CR440 and may be taken only once for credit. .

## CR 541 -Storytelling and Conflict Resolution (4)

Storytelling plays a role in limiting, creating and sustaining creative conflict res olution. Critical thinking and deliberate analys is used to deconstruct the grand narratives of dominant discourse, explore counter narratives emerging
from the margins, and examine how res olution - and social change - has surfaced as a result.

Also offered for undergraduate-levelcredit as CR441 and may be taken only once for credit. .

## CR 542 - Peace Education (4)

A theoretical and practical introduction to the field of Peace Education. Explores the philosophical, cultural, pedagogical and curricular elements of Peace Education. Develops understanding of the theory and practice of effective conflict res olution education.

Also offered for undergraduate-levelcredit as CR 442 and may be taken only once for credit. .

## CR 543 - Nationalism and Democracy in a Post-9/11 World (4)

Examines the rise of American nationalismin the aftermath of9/11 and its impact on America's relationship to the world. Nationalist and democratic ideologies are examined from a peace and conflict studies perspective, with attention to implications for war and peace. Special focus on political and ideological shifts since 2016.
Also offered for undergraduate-levelcredit as CR 443 and may be taken only once for credit. .

## CR 544 - Neighbors and Enemies: Cyprus, Greece and Turkey (4)

Focuses on the protracted ethno-nationalist conflict in Cyprus and Greek-Turkish relations. The Cyprus problem is investigated as a case study in nationalist conflict in the context of domestic, regional and international conflict dynamics. Trends toward conflict de-escalation and reconciliation in the context of the EU are also studied.
Also offered for undergraduate-levelcredit as CR444 and may be taken only once for credit. .

## CR 545 - Gender and Conflict Resolution (4)

Explores the social construction of gender and its impact on conflict. Ps ychological theories, violence and aggression, communication styles, culture, societal structures, conflict resolution paradigms and war and peacebuilding are analyzed. Examines micro and macro is sues connected to gender, peace, conflict and violence.
Also offered for undergraduate-levelcredit as CR445 and may be taken only once for credit. .

## CR 546 - Human Rights and Conflict Resolution (4)

Key actors and core elements to promoting human rights as a conflict resolution mechanismaround the world.

Also offered for undergraduate-levelcredit as CR 446 and may be taken only once for credit.

## CR 547 - Civil Society and Conflict Resolution (4)

Explores the multi-faceted conflict res olution roles of civil society and non-governmental actors in helping societies experiencing strife, rebuild, manage and prevent conflict.
Also offered for undergraduate-level credit as CR447 and may be taken only once for credit.

## CR 548 - Transitional Justiceand Peacebuilding (4)

Transitional justice as legal and non-legal initiatives to bring clos ure, healing, and reconciliation after tragedies.
Also offered for undergraduate-level credit as CR448 and may be taken only once for credit. Prerequisite: Upperdivision standing.

## CR 549 - Intro to Holocaust and Genocide Studies (4)

Introduction to Holocaust and Genocide Studies presents the historical context of the Holocaust, including timelines and events, as a means to understand how the definitions and understandings of genocide and atrocity have developed in response. Diverse stories of subsequent atrocities will be presented, and students will have the opportunity to draw parallels between the past and current events in the world, enhancing a robust and complex understanding of genocide. We will focus on genocide prevention, offering models of successful prevention noting key precursors to genocide/atrocities.
Also offered for undergraduate-level credit as CR 449 and may be taken only once for credit.

## CR 550 - Holocaust and Genocide/Atrocity Prevention Synthesis (4)

Students will have the opportunity to integrate their certificate learning into a project that prepares themto apply knowledge in their works as educators, activists, policy makers, social justice advocates, and/or ngo/international-development workers. This course will be run as a one-termseminar, inviting students into conversation with one another about their res earch interests, and/or their career goals that incorporate learning from cours ework. This course may be taken for credit up to two times.
Prerequisite: CR 546, GRN 520, and 8 approved elective credits.

## CR 551 - Conflict Analysis andStrategic Mediation (4)

Surveys international disputes through a conflict transformation lens. Topics drawn fromdiverse conflicts world-wide, including international models and national policies. Case studies will be examined and developed in order to build skills for diagnosing conflict and for developing actionable strategies for peace building.
Also offered for graduate-levelcredit as CR 451 and may be taken only once for credit.

## CR 552 - Technology and Global Affairs: A Peace and ConflictStudies Perspective (4)

Hi-tech organizations, their instruments, their power, and mode of operation, in both the public and private sector, will be analyzed fromthe vantage point of how they contribute globally to peace and security and/or to polarizations and conflict. Topics include: technology and globalization; digital economies; hi-tech organizations; post-truth in social media; challenges to democracy; the surveillance state; the surveillance corporation; national security and citizen rights; cyber wars; cyber peace.

Also offered for undergraduate-level credit as CR 452 and my be taken only once for credit.

## CS - Computer Science

## CS 105 - Computing Fundamentals I (4)

Intended as an overview of computers and computer technology for non-CS majors, this course is often described as a computer literacy course. The primary focus is on the personal computer and personal productivity software. Hardware components of computers such as processors, memory, and input/output devices are discussed and compared. Software is the primary focus of the course. The main topics are systemsoftware (W indows, OS X, etc) and applications (such as browsers, word processors, s preadsheets, presentation graphics and database managers). The course concludes with discussions concerning legal and ethical is sues surrounding computer technology, management information systems, and systems analysis. Expected preparation: high school algebra.

## CS 106 - Computing Fundamentals II (4)

Introduction to programming, appropriate for non-CS majors. Introduction to the logical thought processes and problem-solving strategies used when programming. Concepts presented include problemdefinition and requirements gathering, generating a description of a step-by-step solution (the algorithm), writing a program, testing, and documentation. The programming language Visual Bas ic is used; several programming projects are completed during the term. Expected preparation: high school algebra, knowledge of W indows and the ability to use Windows Explorer.

## CS 107-Computing Fundamentals III (4)

Introduction to Web programming and associated web tool us age for non-CS majors. Centering around the more sophisticated aspects of browsers. Web pages that represent the input to browsers are defined. In-depth study of HTML, VBScript and JavaScript. Brief exploration into

CGI Scripts and other server-side tools. Course differentiates between Web pagedesign (a graphics designer's role) and Web page programming, taking the results of their work and committing it to workable code. Recommended prerequisites: high school algebra and CS106 or some programming experience.

## CS 161 - Introduction to Programming and ProblemSolving (4)

Introduction to fundamental concepts of computer science. Problemsolving, algorithmand programdesign, data types, loops, control structures, subprograms, and arrays. Learn to write programs in a high level programming language. Surveys currents ocial and ethical as pects of computerscience. Recommended prerequisite: Mth 111.

## CS 161L - Introduction to Programming and ProblemSolving Laboratory (0)

Lab for CS 161 Introduction to Programming and Problem-Solving.

## CS 162 - Introduction to Computer Science (4)

The goals of this class are to teach the syntax of $\mathrm{C}++$ to students who already know how to program. Students are expected to be proficient at using conditionals, $I / \mathrm{O}$, loops, and functions with arguments. Topics include: conditionals, I/O, files, functions, classes, pointers, dynamic memory, linear linked lists, and multidimensional arrays in $\mathrm{C}++$, as well as programcorrectness, verification, and testing. Three hours lecture and one3hour laboratory. The laboratory emphasizes practical programming skills.

Prerequisite: CS 161.
CS 162L - Lab for CS 162 (0)
Lab for CS 162.
Corequisite: CS 162.

## CS 163 - Data Structures (4)

Data abstraction with formal specification. Elementary algorithmanalysis. Basic concepts of data and its representation inside a computer. Linear, linked, and orthogonal lists; tree structures. Data structures are implemented as data abstractions using pointer based implementations. Sorting and search strategies. Data management. Threehours lecture and one 3-hour laboratory. The laboratory emphasizes practical programming skills.
Prerequisite: CS 162 with a grade of Cor better. Corequisites: concurrent enrollment in CS163L. Corequisite: CS 163L.

## CS 163L-Lab for CS 163 (0)

Lab for CS 163.
Corequisite:CS 163.
CS 199 -Special Studies (0-12)
(Credit to be arranged.)

## CS 201 - Computer Systems Programming (4)

Introduction to computer systems from a software perspective. Topics include: Basic machine organization, Systemprogramming using C and assembly language, Introduction to systemprogramming tools (gcc, makefile, gdb), Data representation (bits bytes, characters, integers, floating point numbers), Implementation of control flow, procedure calls, and complexdata types at machine level, Linking and loading, Exceptions and interrupts, Process control and signals, Systemcalls, File I/O, Timing and improving programperformance, Introductionto memory hierarchy, dynamic memory allocation techniques.
Prerequisite: CS 162.

## CS 250 - Discrete Structures I(4)

Introduces discrete structures and techniques for computing. Sets. Graphs and trees. Functions: properties, recursive definitions. Relations: properties, equivalence, partial order. Proof techniques, inductive proof. Counting techniques and discrete probability.
Prerequisite: CS 161 or CS 162, and Mth 251.

## CS 251 - Discrete Structures II (4)

Continuation of CS 250 . Logic: propositionalcalculus, first-order predicate calculus. Formal reasoning: natural deduction, resolution. Applications to programcorrectness and automatic reasoning. Introduction to algebraic structures in computing.
Prerequisite: CS 250.

## CS 299-Special Studies (0-4)

(Credit to be arranged.)

CS 299L- Lab for CS 299 (0)
Lab for CS 299.

## CS 302-Programming Methodologies and Software Implementation (4)

Introduces principles and techniques for producing highquality software solutions to computational problems using modern programming languages. Importanttopics include: analys is of informal specifications and documentation; unit
testing; abstract data types; object-oriented and functional programming designtechniques; anduse of software libraries. Laboratory exercises will include application of contemporary software tools, including integrated development environments, debuggers, version control, and build frameworks.

Prerequisite:CS 163, CS 201. Corequisite: CS 302L.
CS 302L- Lab for CS 302 (0)
Lab for CS 302L.
Corequisite: CS 302.

## CS 305 -Social, Ethical, and Legal Implications of Computing (2)

History of computing, social context of computing, professional andethical res ponsibilities, risks and liabilities of safety-critical systems, intellectual property, privacy and civil liberties, social implications of the Internet, computer crime, economic is sues in computing.
Prerequisite: a course in computer science at the 300 or higher level. Sophomore inquiry or a course in public speaking and a course in writing a research paper.

## CS 311 -Computational Structures (4)

Introduces the foundations of computing. Regular languages and finite automata. Context free languages and pushdown automata. Turing machines and equivalent models of computation. Computability. Introduction to complexity. An appropriate programming language is used for programming experiments.
Prerequisite:CS 250, 251.

## CS 313 -Artificial Intelligence and Game Design (4)

Study of the basic principles of computer game design, the most popular techniques and technologies for game implementation, focusing on the many ways in which advances in artificial intelligence influences game design.
Prerequisite: Prior computer programming experience equivalentto CS 163.

## CS 314 -Elements of Software Engineering (4)

Practical techniques of program development for mediumscale software produced by individuals. Software development fromproblem specification through design, implementation, testing, and maintenance. The fundamental design techniques of step-wise refinement and data abstraction. A software project will be carried through the development cycle.

Prerequisite: CS 163, CS 201, CS 302.
CS 333 - Introduction to Operating Systems (4)
Introduction to the principles of operating systems and concurrent programming. Operating system services, file
systems, resource management, synchronization. The concept of a process; process cooperation and interference. Introduction to networks, and protection and security. Examples drawn from one or more modern operating systems. Programming projects, including concurrent programming.
Prerequisite: CS 201, 202.

## CS 333L - Introduction to Operating Systems Lab (0)

Lab for Introduction to Operating Systems.
Corequisite: CS 333.

## CS 340 - Discrete Structures for Engineers (4)

A one-termintroduction to discrete structures with applications to computing problems. Topics include sets, relations, functions, counting, graphs, trees, recursion, propositional and predicate logic, proof techniques, Boolean algebra. Thecourse may not be used as part of the degree requirements for the BS degree in Computer Science.

Prerequisite: CS 163, Math 252.
CS 345 - Cyberculture: The Internet and Popular Culture (4)
Study of the effect of computers and the internet on popular culture. Graduates of the course will become more intelligent and successful users of the Internet, understand how the internet works, be aware of the wide variety of applications that exist on the internet, and will unders tand the primary principles that underlie the success the Internet has had in changing popular culture. Typical topics will include history and technologies of the web, social networks, the long tail in business and culture, the power of groups, user generated content, complexs ystems, virtual worlds and the power of search.

Prerequisite: Sophomore Inquiry: Popular Culture (UNST 254).

## CS 345 - Cyberculture: The Internet and Popular Culture (4)

Study of the effect of computers and the internet on popular culture. Graduates of the course will become more intelligent and successful users of the Internet, understand how the internet works, be aware of the wide variety of applications thatexist on the internet, and will understand the primary principles that underlie the success the Internet has had in changing popular culture. Typical topics will include history and technologies of the web, social networks, the long tail in business and culture, the power of groups, user generated content, complexsystems, virtual worlds and the power of search.

## CS 346U- Exploring Complexity in Science and Technology (4)

Introduction to ComplexSystems, an interdisciplinary field that studies how collections of simple entities org anize themselves to produce complexbehavior, use information, and adapt and learn. Focuses on common principles underly ing complexity in science and technology, and includes ideas fromphysics, biology, the social sciences, and computer science. The course may not be used as one of the upper-division CS Electives for the BS degree in Computer Science. This course is the same as SySc 346; course may be taken only once for credit.
Cross-Listed as: SySc 346U.
CS 347U- The Internet Age (4)
Examination of the Internet and its evolution over the last 30 years to become an essential part of today's society. Also examines the impact the Internet has had on society as well as potential threats to its continued success. The course may not be used as one of the upper-division CS Electives for the BS degree in Computer Science.

## CS 348U- Digital Media, Technology and Society (4)

Covers, froma computing perspective, the transition of society to one that is primarily digital. Provides an understanding of digital media, its technicallimitations, copyright and digital rights management, and digital media communications. The course may not be used as an upperdivision CS Elective for the BS degree in Computer Science.

## CS 350 - Algorithms and Complexity (4)

Techniques for the design and analy sis of algorithms. Case studies of existing alg orithms (sorting, searching, graph algorithms, dynamic programming, matrix multiplication, fast Fourier transform.) NP-Completeness.
Prerequisite: CS 250 and CS 251.
CS 358 - Principles of Programming Languages (4)
Syntaxand semantics. Compilers and interpreters. Programs as data. Regularexpres sions and context free grammars. Programming paradigms, including procedural, functional, and object-oriented programming. Type systems, including dynamic and static typing disciplines. Binding, scope, data abstraction, and modularity. Denotational, operational, and axiomatic semantics. Introduction to programcorrectness.

Prerequisite: CS 302, CS 314, and CS 350.

## CS 399 -Special Studies (0-6)

(Credit to be arranged.) Consent of instructor.

CS 399L- Lab for CS 399 (0)
Lab for CS 399 special studies.

## CS 399P -Special Studies (1-6)

(Credit to be arranged.)

## CS 401 - Research (1-6)

(Credit to be arranged.) Consent of instructor.

## CS 402 - Independent Study (1-12)

(Credit to be arranged.)

## CS 403-Honors Thesis (1-4)

(Credit to be arranged.) Consent of instructor.

## CS 404-Cooperative Education/Internship (1-12)

(Credit to be arranged.) Consent of instructor.

## CS 405 - Reading and Conference (1-6)

(Credit to be arranged.) Consent of instructor.

## CS 406 -Special Projects (1-6)

(Credit to be arranged.) Consent of instructor.

## CS 407 -Seminar (1-6)

(Credit to be arranged.) Consent of instructor.

## CS 409-Practicum(1-9)

(Credit to be arranged.) Consent of instructor.

## CS 410 -SelectedTopics (1-6)

(Credit to be arranged.) Consent of instructor.

## CS 410L-Selected Topics Lab (0)

Lab for CS 410.

## CS 410P - SelectedTopics (1-6)

Programming intensive version ofCS 410. (Credit to be arranged.) Consent of instructor.

## CS 415 -Parallel Programming (4)

An introduction to parallel programming concepts and techniques. Topics include: parallel programming models and languages, share-memory programming, mes sagepassing programming, performance models and analysis techniques, domain-specific parallel algorithms.

Also offered for graduate-level credit as CS 515 and may be taken only once for credit. . Prerequisite: CS 302 and CS 333.

CS 415L- Lab for CS 415P(0)
Lab for CS 415P Parallel Programming.
Corequisite: CS 415P.

## CS 415P - Parallel Programming (4)

An introduction to parallel programming concepts and techniques. Topics include: parallel programming models and languages, share-memory programming, mes sagepassing programming, performance models and analysis techniques, domain-specific parallel algorithms.

Prerequisite: CS 302 and CS 333. Corequisite:CS 415L.

## CS 420 -Object-Oriented Programming and Design (4)

The fundamentalconcepts of object-oriented programming, including object-oriented modeling and design. The focus of the course will be to help students create programs that model their application domain, that exhibit that model to other programmers who read the code, and that are as a consequence maintainable and robust to change. Issues addressed may include data abstraction and modeling, the use and misuse of inheritance, higher-order data structures and their operations, reu sability, refactoring, concurrency control, and us ability. Includes programming as signments in an OO language.
Also offered for graduate-level credit as CS 520 and may be taken only once for credit. . Prerequisite: CS 358 .
CS 420P - Object-Oriented Programming (4)
The fundamentalconcepts of object-oriented programming languages, including data abstraction and typing, class inheritance and generic types, prototypes and delegation, concurrency control and distribution, object-oriented databases, and implementation. To illustrate these is sues, programming as signments in languages such as Smalltalk, Eiffel and C++ will be given.
Prerequisite: CS 358.

## CS 421 - Programming Language Implementation: Syntax and Static Semantics (4)

Techniques and tools for construction of compiler and interpreter front-ends, including: representation of programs using abstract syntaxtrees; lexical analysis, and lexer generators; parsing (recursive descent, top-down, and bottom-up), and parsergenerators; type checking and static analysis. Design and implementation of a front-end fora small programming language.
Prerequisite: CS 201, CS 302, CS 314, and CS 358.

## CS 421L-Lab for CS 421 (0)

Lab for CS 421.

## CS 421P - Programming Language Implementation: Syntax and Static Semantics (4)

Techniques and tools for construction of compiler and interpreter front-ends, including: representation of programs using abstract syntaxtrees; lexical analysis, and lexer generators; parsing (recursive descent, top-down, and bottom-up), and parser generators; type checking and static analys is. Design and implementation of a front-end for a small programming language.
Prerequisite: CS 201, CS 302, CS 311, CS 314, and CS 358.

## CS 422 - Programming Language Implementation:

 Code Generation and Dynamic Semantics (4)Techniques and tools for construction of compiler and interpreter back-ends, including: interpreter design; code generation strategies for standard programming constructs; intermediate representations; optimization techniques; runtime organization, including functions, objects, and closures; run-time systems. Design and implementation of an interpreter and a compiler back-end for a small programming language.
Prerequisite: CS 201, CS 302, CS 311, CS 314, and CS 358.

CS 422L-Lab for CS 422 (0)
Lab for CS 422.

## CS 422P-Programming Language Implementation: Code Generation and Dynamic Semantics (4)

Techniques and tools for construction of compiler and interpreter back-ends, including: interpreter design; code generation strategies for standard programming constructs; intermediate representations; optimization techniques; runtime organization, including functions, objects, and closures; run-time systems. Design and implementation of
an interpreter and a compiler back-end for a small programming language.
Prerequisite: CS 201, CS 302, CS 314, and CS 358.

## CS 430P - Internet, Web, \& Cloud Systems (4)

Covers modern networked computing systems andthe abstractions they provide. Specifically, students will learn about and apply their knowledge of topics such as Internet protocols, virtual machines and containers, web servers and frameworks, and databases as well as their deployment in modern cloud environments.

Also offered for graduate-level credit as CS 530 and may be taken only once for credit. Prerequis ite: Upper-division standing and admis sion into the CS program.

## CS 431 - Introduction to Performance Measurement, Modeling and Analysis (4)

A survey of the fundamentals of computer application and systemperformance. Hands on programming exercises will allow us to apply thetechniques to increasingly complex problems. We will use a variety of state of the art tools for measurement, modeling, simulation, and analysis throughout the course.
Also offered for graduate-level credit as CS 531 and may be taken only once for credit. Prerequisite: CS 201 and CS 302 and CS 333.

## CS 435 - Accelerated Computing (4)

Heterogeneous approaches that use special-purpose processors to accelerate the execution of a variety of applications. GPUs, Intel Xeon Phi, APUs, FPGUs. The sustainability implications of these platforms. Lectures, homeworks, labs, and group programming projects using NVIDIA GPUs and Intel Xeon Phi.

Also offered for graduate-level credit as CS 535 and may be taken only once for credit. Prerequisite: CS 333.
CS CS 435L - Lab for CS 435 (0)
Lab for CS 435.
Corequisite: CS 435 .

## CS 438 - Computer Architecture (4)

Proces sors, memory hierarchy, and bus systems. Multilevel caches and cache coherence in MP systems. Arithmetic algorithms. RISC vs. CISC instructions, pipelining, and software pipelining. Superscalar, super pipelined, and VLIW architectures. Connection networks. Performance evaluation, simulation, and analytic models. Performance enhancement through branch prediction and out-of-order execution.

Also offered for graduate-level credit as CS 538 and may be taken only once for credit. .Prerequisite: CS 333 .

## CS 440 - Deep Learning: Computational Structures and Programming (4)

Deep learning is a powerfultool for machine learning systems. This class provides an introduction to this topic and will focus on classic as well as emerging deep learning techniques. Topics studied include multi-layer perceptrons, convolution neural networks, long-short termmemory, attention mechanisms, autoencoders, generative adversarial networks, and natural language models. The clas s will focus on learning concepts and applying themvia several programming as signments.

Also offered for graduate-level credit as CS 540 and may be taken only once forcredit. Prerequisite: CS 350.

## CS 441 - Artificial Intelligence (4)

Introduction to the basic concepts and techniques of artificial intelligence. Knowledge representation, problem solving, machine learning, natural language understanding, and AI search techniques.

Also offered for graduate-level credit as CS 541 and may be taken only once for credit. . Prerequisite: CS 302.

## CS 442 - Advanced Artificial Intelligence: Combinatorial Games (4)

Covers the theory and practice of finding optimal and satisfying solutions to one-player and two-player combinatorial games, including such popular games as Sokoban, Othello, checkers, chess, backgammon, bridge, and CCGs. Simple applications in decision theory and economics may also be discussed. Emphas is on implementation of state-of-the-art solution techniques.
Also offered for graduate-level credit as CS 542 and may be taken only oncefor credit. . Prerequisite: CS 302 or experience with algorithms and data structures.

## CS 442P - Advanced Artificial Intelligence: Combinatorial Games (4)

Covers the theory and practice of finding optimal and satisfying solutions to one-player and two-player combinatorial games, including such popular games as Sokoban, Othello, checkers, chess, backgammon, bridge, and CCGs. Simple applications in decision theory and economics may als obe discussed. Emphas is on implementation of state-of-the-art solution techniques.
Prerequisite: CS 302 or experience with algorithms and data structures.

## CS 443 - Advanced Artificial Intelligence: Combinatorial Search (4)

Explores methods for the solution of constraint satisfaction and related problems using search techniques, in the context of real-world problems such as resource-bounded scheduling, enterprise planning, classical planning, and
one- and two-player games.Emphasis on coding projects, and on reading and reporting on selected literature.

Also offered for graduate-level credit as CS 543 and may be taken only once for credit. . Prerequisite: CS 302 or experience with algorithms and datastructures.

## CS 445 - Machine Learning (4)

Provides a broad introduction to techniques for building computer systems that learn fromexperience; conceptual grounding and practical experience with several learning systems; and grounding for advanced study in statistical learning methods, and for work with adaptivetechnologies used in speech and image processing, robotic planning and control, diagnostic systems, complexs ystem modeling, and iterative optimization. Students gain practical experience implementing and evaluating systems applied to pattern recognition, prediction, and optimization problems.
Also offered for graduate-levelcredit as CS 545 and may be taken only once for credit. . Prerequisite: Mth 261 OR Mth 343; CS 302.

## CS 446 - Advanced Topics in Machine Learning (4)

Covers a number of more advanced topics in machine learning from a more mathematically oriented view. Provides preparation for successfully using machinelearning techniques for various applications. Also provides preparation for graduate-level research in machine learning and adaptive systems.

Also offered for graduate-level credit as CS 546 and may be taken only once for credit. . Prerequisite: CS 445/545.

## CS 447 - Computer Graphics (4)

This course will provide an introduction to graphics systems and applications. Bas ic structure of interactive graphics systems, characteristics of various hardware devices. Control of display devices, implementation of simple packages, device independence, and standard packages. Dis tributed architectures for graphics, hidden line and hidden surfaces algorithms, representations of curves and surfaces.

Also offered for graduate-level credit as CS 547 and may be taken only oncefor credit. . Prerequisite: CS 302, Mth 261.

## CS 447P - Computer Graphics (4)

This course will provide an introduction to graphics systems and applications. Basic structure of interactive graphics s ystems, characteristics of various hardware devices. Control of display devices, implementation of simple packages, device independence, and standard packages. Dis tributed architectures for graphics, hidden line and hidden surfaces algorithms, representations of curves and surfaces.

Prerequisite: CS 302, Mth 261.

## CS 451 - Numerical Computation (4)

Introduction to numerical methods. Includes topics from elementary discussion of errors, polynomials, interpolation, quadrature, linear systems of equations, and solution of nonlinear equations.
Also offered for graduate-credit as CS 551 and may be taken only once for credit. . Prerequisite: Mth261; CS 201.

## CS 452 - Building Software Systems with Components

 (4)Designed to familiarize students with the concepts behind and opportunities afforded by modern component architectures, such as Microsoft COM, Java Beans, and CORBA. Students are exposed to component development techniques and methods for developing complex software architectures using components. Students become familiar with component development, scripting and composing components, and thestrengths and weaknesses of using components in designing large complexs oftware systems.
Also offered for graduate-level credit as CS 552 and may be taken only once for credit. . Prerequisite: CS 314, CS 333, CS 350; knowledge of C++ or Java programming.
CS 454 -Software Engineering (4)
Current methodologies for the development of large, indus trial strength software systems. Topics include requirements, specification, design, implementation, testing, project management and cost estimation, formal methods, and software process improvement.
Also offered for graduate-level credit as CS 554 and may be taken only once for credit. . Prerequisite: CS 302, CS 314, and CS 358.

## CS 457 - Functional Programming (4)

Introduction to functional notation, recursion, higher-order functions, reasoning about functions, and models for the evaluation of applicative expressions. Use of functional languages.

Also offered for graduate-level credit as CS 557 and may be taken only onceforcredit. .Prerequisite: CS 302.
CS 461 - Open Source Software Development Laboratory (4)
Explores Open Source software engineering and its methodologies in a laboratory classroomsetting. Focuses on the development and delivery of Open Source software projects by teams of 1-3 students. Students prepare and present material, working using email and the web.
Also offered for graduate-level credit as CS 561 and may be taken only once forcredit. .Prerequisite: CS 314.

## CS 461P - Open Source Software Development Laboratory (4)

Explores Open Source software engineering and its methodologies in a laboratory classroomsetting. Focuses on the development and delivery of Open Source software projects by teams of 1-3 students. Students prepare and present material, working using email and the web.
Prerequisite: CS 314.

## CS 462 - Advanced Open Source Software Engineering

 (4)Surveys the growing academic literature describing tools, techniques, community management, project management and collaboration strategies used in open source software development. Emphasis is placed upontool-driven development, upon open development processes and tools, and upon comparison with processes and practices in proprietary software.
Also offered for graduate-level credit as CS 562 and may be taken only oncefor credit. . Prerequisite: CS 314.

## CS 463 - Intro to Web Development (4)

Students will learn the fundamentals of web development, the structure and functionality of the web, and how to create responsive and accessible web applications using HTML, CSS, and JavaScript.

Also offered for graduate-level credit as CS 563 and may be taken only once for credit. Prerequisite: Admission to the program.

## CS 464P - Front End Web Technologies (4)

Students will learn the languages, libraries, and frameworks needed to build user interfaces. This class will start with a review of HTML, CSS, and JavaScript, before focusing on Reactand the React ecosystem. Students will also work with CSS animations, gain experience with data visualization libraries, and learn about design principles and design systems. The final project is a dashboard application, which will leverage many of the topics covered in class and give students theopportunity to create a data-driven React application.
Also offered for graduate-level credit as CS 564 and may be taken only once for credit. Prerequisite: CS 463.

## CS 465P - Full Stack WebDevelopment (4)

This class provides an overview of how the web works and covers the spectrumof full stack web development, including using front-end and back-end frameworks to build acces sible and responsive applications.

Also offered for graduate-level credit as CS 565 and may be taken only once for credit. . Prerequisite: CS 302, CS 463.

## CS 466 - Voice Assistants (4)

Provides an introduction to voice technologies and how to design and build voice-enabled applications, by learning the concepts, techniques, and frameworks needed to build fully functional chatbots and virtual as sistants. Students will explore the conversational design process and how to build effective voice user interfaces (VUIs) and conversational user interfaces (CUIs), and create voiceenabled applications and virtual assistants using popular APIs and platforms. Course assumes a working knowledge of JavaScript and Node.js or Python.
Also offered for graduate-level credit as CS 566 and may be taken only onceforcredit. Prerequisite: Admis sion to program.

## CS 467 - The Wireless Web (4)

Covers the basics of the Wireless Application Protocol (WAP) as used in modern mobile phones and other handheld devices. Provides an overview of the WAP architecture, as well as an in-depth exploration of the WAP Application Layer (WAE), including WML, WMLScript, and the WAP push framework.
Also offered for graduate-level credit as CS 567 and may be taken only once forcredit. Prerequisite: CS 465/565.

## CS 469 - Software Engineering Caps tone I (3)

Emphasizes teamwork on a substantial project that will be developed for a real customer. The course integrates the knowledge and skills fromthe rest of the CS curriculum. This course creates an obligation for participation for two consecutive quarters. This is the first course in a sequence of two CS 469, CS 470 and must be taken in sequence. Offered as P/NP only.

Prerequisite: CS 302, CS 314, CS 333, CS 350, CS 358, and at least one Programming intensive course.
CS 470 - Software Engineering Caps tone II (3)
Emphasizes teamwork on a substantial project that will be developed for a real customer. The course integrates the knowledge and skills fromthe rest of the CS curriculum. This course creates an obligation for participation for two consecutive quarters. This is the second course in a sequence of two CS 469, CS 470 and must be taken in sequence. Offered as P/NP only.
Prerequisite: CS 469.

## CS 480 - Randomized Algorithms and Probabilistic Analysis (4)

Probabilistic tools used in the design and analysis of modern algorithms and data structures. Topics include: review discrete random, occupancy problems, tail bounds, Markov chains, the probabilistic method, marting ales, Monte Carlo methods. The course explores a variety of CS applications.

Also offered for graduate-level credit as CS 580 and may be taken only once for credit. . Prerequisite: CS 350, Stats 451.

## CS 485 - Cryptography (4)

The goal of cryptography is theencoding of information via a cryptographic s ystem. Cryptanalysis studies the breaking of cryptosystems. This course focuses on cryptography but with respect to cryptanalysis. An overview of clas sical systems with an in-depth examination of modern cryptosystems. This includes block algorithms such as DES; public-key cryptosystems, such as RSA; and one-way functions. Additional topics include cryptographic protocols, signature schemes, pseudorandomnumber generation, Shannon's information theory, and streamciphers.

Also offered for graduate-level credit as CS 585 and may be taken only once for credit. . Prerequisite: CS 350.

## CS 486 - Introduction to Database Management Systems (4)

Introduction to fundamental concepts of database management systems using primarily the relational model. Schema design and refinement. Query languages. Database application developmentenvironments. Overview of physical data organization, query optimization and processing, physical design, security, and trans actions used in recovery and concurrency control. Expected preparation: CS 251.

Also offered for graduate-level credit as CS 586 and may be taken only once for credit. . Prerequisite: CS 161 and CS 250 .

## CS 487 - Database Management Systems Implementation (4)

Internal design of a relational database management system. Concurrency control; lock managers; crash recovery; query and operator evaluation; query optimization; storage management; indexstructures; systemcatalogs.

Also offered for graduate-level credit as CS 587 and may be taken only once for credit. . Prerequisite: CS 486 and CS 333.

## CS 487P - Database Management Systems Implementation (4)

Internal design of a relational database management system. Concurrency control; lock managers; crash recovery; query and operator evaluation; query optimization; storage management; indexstructures; systemcatalogs.
Prerequisite: CS 486 and CS 333.

## CS 488P - Cloud and Cluster Data Management (4)

Covers advanced data management solutions emerging for cloud and cluster computing environments, focusing on horizontal and vertical scalable approaches. Also covers principles behind data management in these environments, plus specific data management systems that are currently in use or being developed. Topics range fromnovel data processing paradigms to commercial data management platforms and open-sourceNoSQLdatabases. Students will gain broad knowledge about these systems and practical experience with them.

Also offered for graduate-level credit as CS 588 and may be taken only once forcredit. Prerequisite: CS 486 or consent of the instructor.

## CS 489 - Blockchain Development \& Security (4)

Overview of blockchain systems, how they are built, and how they can be exploited. Students will get hands-on experience working with public blockchains as well as build and deploy permis sioned blockchains. They will then examine security vulnerabilities in blockchain systems and how they may be automatically exploited.
Also offered for graduate-level credit as CS 589 and may be taken only once forcredit. Prerequisite: Upper-division standing.

## CS 490 - Introduction to Multimedia Computing and Networking (4)

Introductory course in multimedia computing and networking intended for senior undergraduate or graduate level students. The objective of this course is to introduce many of the fundamental concepts involved with handling multimedia data and applications. The course will cover (i) basic representation and compression of multimedia data types including H.261, JPEG, and MPEG, (ii) techniques to support multimedia quality-of-service in computing and networked systems, and (iii) networked streaming media techniques such as buffering and adaptation.

Also offered for graduate-level credit as CS 590 and may be taken only once forcredit. Prerequisite: CS 333 or instructor's permission. .

## CS 491 - Introduction to Computer Security (4)

Provides a broad overview of computer security. Provides a solid theoretical foundation, as well as real-world examples, for understanding computer security. Fundamental theoretical results, foundational models, and salient examples will be covered. Security in computer operating systems, networks, and data will be covered, with emphas is on operating systemand programsecurity.
Also offered for graduate-level credit as CS 591 and may be taken only once for credit. . Prerequisite: CS 333, CS 350, C and Java programming.

## CS 492 -Malware Reverse Engineering (4)

Studies the techniques malicious code developers employ to exploit vulnerable computer systems. The course explores the formand function of a range of malware while exploring how the increased mixing of code and data is now exposing us to an array of security vulnerabilities and exploits. Given thesethreats, thecourse will then examine modern defenses against malware and how they can be used to protect users.
Also offered for graduate-level credit as CS 592 and may be taken only once for credit. . Prerequisite: Juniorstanding and admis sion into the CS program.

## CS 493 -Digital Forensics (4)

Detailed, hands-on approach to the investigation of criminal incidents in which computers or computer technology play a significant or interesting role. Familiarization with the core computer science theory and practical skills necessary to performrudimentary computer forensic investigations, understanding the role of technology in investigating computer-based crime, and preparation to deal with investigative bodies.
Recommended: CS 333 or CS 533. No prior background in criminal justice or law is assumed.

Also offered for graduate-level credit as CS 593 and may be taken only once for credit. .

## CS 494 - Internetworking Protocols (4)

Advanced study of the protocols and algorithms used in the Internet (IETF) family of networking protocols. For example, ARP, IP, UDP, TCP, multicasting, routing protocols like RIP and OSPF, and application protocols like DNS, NFS, SNMP, FTP and HTTP. Issues such as addressing, name service, protocol design, and scalability will be explored.
Also offered for graduate-level credit as CS 594 and may be taken only once for credit. . Prerequisite: CS 333.

## CS 494P - Internetworking Protocols (4)

Advanced study of the protocols and algorithms used in the Internet (IETF) family of networking protocols. For example, ARP, IP, UDP, TCP, multicasting, routing protocols like RIP and OSPF, and application protocols like DNS, NFS, SNMP, FTP and HTTP. Issues such as addressing, name service, protocol design, and scalability will be explored.

Prerequisite: CS 333.

## CS 495 - Web and Cloud Security (4)

Covers web and cloud systems and how they can be subverted. The class will focus on the highest risk vulnerabilities, givestudents practical experience in how they work, and study how they can be prevented. The
class will consist mostly of laboratory exercises focused on developing student skills in performing penetration testing.

Also offered for graduate-level credit as CS 595 and may be taken only onceforcredit. Prerequisite: CS 201.

## CS 496 - Network Security (4)

Focus on net work security including a review of various forms of network attacks; a review of basic techniques in applied cryptography, and secure protocols will be covered including network-layer security and various applicationlayer secure protocols. Also covers network-side security management including both passive measures, as well as active intrusion detection and response. Covers protocols for protection of privacy and anonymity.
Also offered for graduate-level credit as CS 596 and may be taken only once for credit. Prerequisite: CS 494.

## CS 497 -Sensor Networks (4)

Foundations of sensor networks, with a focus on activitybased learning through a sequenceof hands-on programming exercises with embedded devices with a high-levelprogramming language. Basic building blocks in designing and deploying a sensor net work application. Positioning and time synchronization of networked sensor devices, wireless communication characteristics of lowpowered radios, energy conservation and harvesting, macro-programming a network of sensor devices and security. Recommended prerequisites: Familiarity with computer systems concepts that could be satisfied by CS 200, CS 201. Familiarity with programming in C, C++ or Java. Familiarity with basic concepts in probability and linear algebra that could be satisfied by Mth 301 or equivalent.

Also offered for graduate-level credit as CS 597 and may be taken only once for credit. .

## CS 498 - Introduction to Wireless Network Protocols (4)

Classification of wireles s networking systems; study of multiple access protocols in single hop and multi-hop networks; performance analysis of protocols; overview of emerging radio technologies for high-throughput next generation systems; study of wireless communication protocol standards for cellular systems; case studies of deployed systems.
Also offered for graduate-level credit as CS 598 and may be taken only once for credit. .Prerequisite: CS 250 or ECE 271.

CS 501 - Research (1-9)
(Credit to be arranged.) Consent of instructor.

CS 502 - Independent Study (1-9)
(Credit to be arranged.)

## CS 503 - Thesis (1-9)

(Credit to be arranged.) Consent of instructor.

CS 504 -Cooperative Education/Internship (1-9)
(Credit to be arranged.) Consent of instructor.

CS 505 - Reading and Conference (1-12)
(Credit to be arranged.) Consent of instructor.

## CS 506 -Special Projects (1-9)

(Credit to be arranged.) Consent of instructor.

## CS 507 -Seminar (1-6)

(Credit to be arranged.) Consent of instructor.

CS 509 - Practicum (1-9)
(Credit to be arranged.) Consent of instructor.

## CS 510 -Selected Topics (1-6)

(Credit to be arranged.) Consent of instructor.

## CS 515 - Parallel Programming (3)

An introduction to parallel programming concepts and techniques. Topics include: parallel programming models and languages, share-memory programming, mes sagepassing programming, performance models and analysis techniques, domain-specific parallel algorithms.

Also offered for undergraduate-level credit as CS 415 and may be taken only once for credit. . Corequisite: CS 515L.

## CS 515L - Lab for CS 515P (0)

Lab for CS 515P Parallel Programming.
Corequisite: CS 515.

## CS 520 - Object-Oriented Programming \& Design (3)

The fundamental concepts of object-oriented programming, including object-oriented modeling and design. The focus of the course will be to help students create programs that model their application domain, that
exhibit that model to other programmers who read the code, and that are as a consequence maintainable and robustto change. Is sues addressed may include data abstraction and modeling, the use and mis use of inheritance, higher-order data structures and their operations, reusability, refactoring, concurrency control, and usability. Includes programming as signments in an OO language.
Also offered for undergraduate-level credit as CS 420 and may be taken only once for credit. . Prerequisite: CS 553.

## CS 530 - Internet, Web, \& Cloud Systems (3)

Covers modern networked computing systems and the abstractions they provide. Specifically, students will learn about and apply their knowledge of topics such as Internet protocols, virtual machines and containers, web servers and frameworks, and databases as well as their deployment in modern cloud environments.

Also offered for graduate-level credit as CS 430P and may be taken only once forcredit. Prerequisite: Graduatestanding and admission into CS program.

## CS 531 - Introduction to Performance Measurement,

 Modeling and Analysis (3)A survey of the fundamentals of computer application and systemperformance. Hands on programming exercis es will allow us to apply the techniques to increasingly complex problems. We will use a variety of state of the art tools for measurement, modeling, simulation, and analysis throughout the course.

Also offered for undergraduate-levelcredit as CS 431 and may be taken only once for credit. Prerequisite: Graduate standing; CS 333 or an equivalent introductory course in Operating Systems.

## CS 532 - Operating System Foundations (3)

Foundational concepts of operating systemdesign including processes, threads, s cheduling, concurrent programming, sy nchronization mechanisms, memory management, virtual address translation, file systems and security. A primary goal of the course is to help graduate students acquire the foundational knowled ge necessary to succeed in CS 533.

## CS 533 - Concepts of Operating Systems (3)

Survey of concepts and techniques used in modern operating systems. Sample concepts covered are concurrency, IPCs, scheduling, res ource allocation, memory management, file systems, and security. Techniques for implementing operating systems taught through a programming project.

Prerequisite: CS 333 or CS 532.

## CS 535 - Accelerated Computing (3)

Heterogeneous approaches that use special-purpose processors to accelerate theexecution of a variety of applications. GPUs, Intel Xeon Phi, APUs, FPGUs. The sustainability implications of these platforms.Lectures, homeworks, labs, and group programming projects using NVIDIA GPUs and Intel Xeon Phi.

Also offered for undergraduate-level credit as CS 435 and may be taken only once for credit.

## CS 538 - Computer Architecture (3)

Proces sors, memory hierarchy, and bus systems. Multilevel caches and cache coherence in MP systems. Arithmetic algorithms. RISC vs. CISC instructions, pipelining, and software pipelining. Superscalar, super pipelined, and VLIW architectures. Connection networks. Performance evaluation, simulation, and analytic models. Performance enhancement through branch prediction and out-of-orderexecution.

Also offered for undergraduate-level credit as CS 438 and may be taken only once for credit. .

## CS 540 -Deep Learning: Computational Structures and Programming (3)

Deep learning is a powerfultoolfor machine learning systems. This class provides an introduction to this topic and will focus on classic as well as emerging deep learning techniques. Topics studied include multi-layer perceptrons, convolution neural networks, long-short termmemory, attention mechanisms, autoencoders, generative adversarial networks, and natural language models. The class will focus on learning concepts and applying themvia several programming as signments.

Also offered for undergraduate-level credit as CS 440 and may be taken only once for credit.

## CS 541 - Artificial Intelligence (3)

Introduction to the basic concepts and techniques of artificial intelligence. Knowledge representation, problem solving, machine learning, natural language understanding, and AI search techniques.
Also offered for undergraduate-level credit as CS 441 and may be taken only once for credit. .

## CS 542 - Advanced Artificial Intelligence: Combinatorial Games (3)

Covers the theory and practice of finding optimal and satisfying solutions to one-player and two-player combinatorial games, including such popular games as Sokoban, Othello, checkers, chess, backgammon, bridge, and CCGs. Simple applications in decision theory and economics may alsobe discussed. Emphas is on implementation of state-of-the-art solution techniques.

Also offered for undergraduate-levelcredit as CS 442 and may be taken only once for credit. . Prerequisite: Experience with algorithms and datastructures.

## CS 543 - Advanced Artificial Intelligence:

Combinatorial Search (3)
Explores methods for the solution of constraint satis faction and related problems using search techniques, in the context of real-world problems such as resource-bounded scheduling, enterprise planning, classical planning, and one- and two-player games. Emphasis on coding projects, and on reading and reporting on selected literature.

Also offered for undergraduate-level as CS 443 and may be taken only once forcredit. Prerequisite: Experience with algorithms and data structures.

## CS 545 - Machine Learning (3)

Provides a broad introduction to techniques for building computer systems that learn fromexperience; conceptual grounding and practical experience with several learning systems; and grounding for advanced study in statistical learning methods, and for work with adaptive technologies used in speech and image processing, robotic planning and control, diagnostic systems, complexs ystem modeling, and iterative optimization. Students gain practical experience implementing and evaluating systems applied to pattern recognition, prediction, and optimization problems.
Also offered as undergraduate-level credit as CS 445 and may be taken only once for credit.

## CS 546 - Advanced Topics in Machine Learning (3)

Covers a number of more advanced topics in machine learning from a more mathematically oriented view. Provides preparation for successfully using machinelearning techniques for various applications. Also provides preparation for graduate-level research in machine learning and adaptive systems.
Also offered for undergraduate-level credit as CS 446 and may be taken only once for credit. . Prerequisite: CS 445/545.

## CS 547 - Computer Graphics (3)

This course will provide an introduction to graphics systems and applications. Basic structure of interactive graphics systems, characteristics of various hard ware devices. Control of dis play devices, implementation of simple packages, device independence, and standard packages. Distributed architectures for graphics, hidden line and hidden surfaces algorithms, representations of curves and surfaces.
Also offered for undergraduate-levelcredit as CS 447 and may be taken only once for credit. .

## CS 549 - Computational Geometry (3)

Perspective and projective geometry. Analytic projective geometry, projective lines and projective planes. Projective transformations of lines and planes. Homogeneous coordinates. Applications to two-dimensional computer graphics. Conic sections in design.

Prerequisite: CS 163 and 451.

## CS 550 - Parallel Algorithms (3)

Definition and nature of parallel computation. Parallel computation fromthe point of view of hardware/architecture, program/scheduling, and algorithms. Why and how parallel computation is different from serial computation. Examples to highlight the differences. Parallel algorithms in general: illustration of the most important features and techniques. Illustration of the limitations. A survey of major results, general formof results, limitations on speed-up.
Prerequisite: CS 350 .

## CS 551 - Numerical Computation (3)

Introduction to numerical methods. Includes topics from elementary discussion of errors, polynomials, interpolation, quadrature, linear systems of equations, and solution of nonlinearequations.

Also offered for undergraduate-credit as CS 451 and may be taken only once for credit. .

## CS 552 -Building Software Systems with Components (3)

Designed to familiarize students with the concepts behind and opportunities afforded by modern component architectures, such as Microsoft COM, Java Beans, and CORBA. Students are exposed to component development techniques and methods for developing complexsoftware architectures using components. Students become familiar with component development, scripting and composing components, and the strengths and weaknesses of using components in designing large complexsoftware systems.

Also offered for undergraduate-level credit as CS 452 and may be taken only once for credit. . Prerequis ite: CS 300, CS 333, CS 350; knowledge of C++ or Java programming.

## CS 553 - Design Patterns (3)

Software design patterns are reusable solutions to recurring software problems. They capture successfulexperiences and convey expert insight and knowledge to less experienced developers. Course provides an in-depth view of patterns using Java as the presentation language. Course is suitable to software architects and developers who are already well-versed in this language. In addition, it offers continuous opportunities for learning the most advanced features of the Java language and understanding some principles behind the design of its fundamental libraries.

Also offered as CS 653 and may be taken only once for credit. . Prerequisite: programming in Java and CS 520.

## CS 554 -Software Engineering (3)

Current methodologies for the development of large, indus trial strength software systems. Topics include requirements, specification, design, implementation, testing, project management and cost estimation, formal methods, and software process improvement.
Also offered for undergraduate-levelcredit as CS 454 and may be taken only once for credit. .

## CS 555 - Software Specification and Verification (3)

Theoretical and practical as pects of the software development process or software lifecycle. Covers the first part of the cycle: formulating the external requirements, specifying what the software is to do, and the abstract design. Emphasis will be on the formal aspects of specification and verification.
Also offered as CS 655 and may be taken only once for credit.

## CS 556 - Software Implementation and Testing (3)

Theoretical and practical as pects of the software development process or software lifecycle. Covers the second part of the cycle: detailed design, implementation in a programming language, testing, and maintenance. Emphas is will be on the technical as pects of software testing.

Also offered as CS 656 and may be taken only once for credit.

## CS 557 - Functional Programming (3)

Introduction to functional notation, recursion, higher-order functions, reasoning about functions, and models for the evaluation of applicative expressions. Use of functional languages.
Also offered for undergraduate-level credit as CS 457 and may be taken only once for credit. . Prerequisite: Graduatestanding and admission into the CS program.
CS 558 - Programming Languages (3)
In-depth study of current and his torical is sues in the design, implementation, and application of programming languages. Topics range frombasic to advanced. Areas include syntax, semantics, scoping, typing, abstraction, exceptions, and concurrency. Computational paradigms such as functional, logic, and/or object oriented are analyzed. Several "recent" programming languages used. Expected preparation: CS 320.
Also offered as CS 658 and may be taken only once for credit. .

CS 559 -Software Measurement and Models (3)
Survey, evaluation, and application of software measurement techniques and models. Particularemphasis on product metrics such as Software Science, Cyclomatic Complexity, and Function Points.

## CS 560 - Human-Computer Interaction (3)

Introduction to the basic theory of human-computer interaction. Principles of human cognition and interface design, interface evaluation techniques. Several prototyping tools will be presented. A project is required.

## CS 561 - Open Source Software Development Laboratory (3)

Explores Open Source software engineering and its methodologies in a laboratory classroomsetting. Focuses on the development and delivery of Open Source software projects by teams of 1-3 students. Students prepare and present material, working usingemail and the web.

Also offered for undergraduate-level credit as CS 461 and may be taken only once for credit. .

## CS 562 - Advanced Open Source S oftware Engineering (3)

Surveys the growing academic literature describing tools, techniques, community management, project management and collaboration strategies used in open source software development. Emphasis is placed upontool-driven development, upon open development processes and tools, and upon comparison with processes and practices in proprietary software.
Also offered for undergraduate-level credit as CS 462 and may be taken only once for credit. .

## CS 563 - Intro to Web Development (3)

Students will learn the fundamentals of web development, the structure and functionality of the web, and how to create res ponsive and accessible web applications using HTML, CSS, and JavaScript.
Also offered for undergraduate-level credit as CS 463 and may be taken only once for credit.

## CS 564 - Front End Web Technologies (3)

Students will learn the languages, libraries, and frameworks needed to build user interfaces. This class will start with a review of HTML, CSS, and JavaScript, before focusing on Reactand the React ecosystem. Students will also work with CSS animations, gain experience with data visualization libraries, and learn about design principles and design systems. The final project is a dashboard application, which will leverage many of the topics
covered in class and give students theopportunity to create a data-driven React application.

Also offered for undergraduate-levelcredit as CS 464P and may be taken only once for credit. Prerequisite: CS 563.

## CS 565 - Full Stack WebDevelopment (3)

This class provides an overview of how the web works and covers the spectrumof full stack web development, including using front-end and back-end frameworks to build accessible and responsive applications.

Also offered for undergraduate-level credit as CS 465P and may be taken only once for credit. . Prerequisite: CS 563.

## CS 566 - Voice Assistants (3)

Provides an introduction to voice technologies and how to design and build voice-enabled applications, by learning the concepts, techniques, and frameworks needed to build fully functional chatbots and virtual as sistants. Students will explore the conversational design process and how to build effective voice user interfaces (VUIs) and conversational user interfaces (CUIs), and create voiceenabled applications and virtual assistants using popular APIs and platforms. Course assumes a working knowledge of JavaScript and Node.js or Python.

Also offered for undergraduate-level credit as CS 466 and may be taken only once for credit.

## CS 567 - The Wireless Web (3)

Covers the basics of the Wireless Application Protocol (WAP) as used in modern mobile phones and other handheld devices. Provides an overview of the W AP architecture, as well as an in-depth exploration of the WAP Application Layer (WAE), including WML, WMLScript, and the WAP push frame work.

Also offered for undergraduate-levelcredit as CS 467 and may be taken only once for credit. . Prerequisite: CS 465/565.

## CS 568 - Functional Logic Programming (3)

Introduction to functional logic programming. Foundations and basic principles of this paradigmwill be explained in some depth and complemented by encoding practical problems in a functional logic language using a leading compiler/interpreter. Focus on non-determinism and computations with incomplete information.
Implementation techniques will be briefly discussed.
Also offered as CS 668 and may be taken only once for credit. . Prerequisite: CS 558 Programming Languages.
CS 569 - ScholarshipSkills for Computer Science and Engineering (3)
The purposeof this course is to make participants better scholars in Computer Science. In particular it attempts to help students become better researchers, better writers,
better presenters, and better reviewers. It concentrates on reading, writing and composition skills: on the production and consumption of the "media" used by computer scientists to communicate professionally. At the completion of the course, students should be familiar with the tasks and activities of modern scholars in computer science.
Also offered as CS 669 and may be taken only once for credit. . Prerequisite: admission into a Ph.D. program within MCECS.

## CS 570 - Machine Learning Seminar (1)

Graduate seminar on machine learning. Students will read and discuss recent papers in the machine learning literature. This one-credit course will be offered each term, and students may take it multiple times.

Prerequisite: CS 445 or CS 545 or permission of instructor.

## CS 572 - Operating System Internals (3)

Internals of a specific operating systemincluding structure of the kernel, block buffering cache, file systemstructure and systemcalls, process structure and scheduling, memory management, device driver interface, and inter process communication.

Also offered as CS 672 and may be taken only once for credit. .

## CS 575 - Computer Systems Analysis (3)

An advanced courseon computer systems. Topics include operating systems, performanceevaluation, device analys is, construction and proof of monitors, file systems, objects and processes, reliability, and protection.
Prerequisite: CS 333, Stat 460.

## CS 576 - Computer Security Research Seminar (3)

Seminar on emerging topics in computer security.
Also offered as CS 676 and may be taken only once for credit. .

## CS 577 - Modern Language Processors (3)

An advanced courseon compiler construction for modern programming languages, such as object-oriented or functional languages. Topics include type-checking, executable intermediate representations, interpretation and virtual machines, code generation for modern architectures, memory management and garbage collection, and optimization.
Also offered as CS 677 and may be taken only once for credit. . Prerequisite: CS 421.

CS 578 - Programming Language Semantics (3)
Introduction to the formal mathematical study of program meaning (semantics), using one or more approaches such
as operational semantics, denotational semantics, or programming logics. Emphas is on rigorous mathematical development and formal proof techniques. Language features to bestudied may includetypes and type safety, purity and imperative effects, functional and modular abstraction, polymorphism, higher-order functions, and object-oriented features. Expected preparation: CS 558 and/orCS 557.
Also offered as CS 678 and may be taken only once for credit. .

## CS 579 - Formal Verification of Hardware/Software Systems (3)

Introduction to the formal verification of functional correctness of hardware and software systems. Topics to be covered include: formal logics for systemverification (first-order logic, higher order logic, temporal logic), formal specifications, theoremproving systems, circuit verification, microprocessor verification, and system software verification.

Prerequisite: CS 333.

## CS 580 - Randomized Algorithms and Probabilistic Analysis (3)

Probabilistic tools used in the design and analysis of modern algorithms and data structures. Topics include: review discrete random, occupancy problems, tail bounds, Markov chains, the probabilistic method, martingales, Monte Carlo methods. The course explores a variety of CS applications.

Also offered for undergraduate-levelcredit as CS 480 and may be taken only once for credit. . Prerequisite: CS 350, Stats 451.

## CS 581 - Theory of Computation (3)

Computability theory: study of models of computation (Turing, Church, Kleene), recursive function theory, properties of recursive, and recursively innumerable sets.
Prerequisite: CS 311.

## CS 582 - Theory of Computation: Advanced Topics (3)

Complexity theory: study of resource bounded computation, the complexity classes ( $\mathrm{P}, \mathrm{NP}, \mathrm{PSPACE}$, and PH ), NP-completeness, relativized computation, randomized classes.
Prerequisite: CS 311, 350.

## CS 583 - Automata and Formal Languages (3)

An advanced study of the theory of automata, formal languages and computational complexity. Main subjects are finite state concepts, formal grammars, computability, Turing machines, and computational complexity.
Prerequisite: CS 582/682.

## CS 584 - Algorithm Design and Analysis (3)

An advanced in-depth study in the design and analy sis of algorithms. Topics include models of computation, sorting, data structures, graph algorithms, matrix multiplication, fast Fourier transform, polynomial arithmetic, pattern matching, and NP-complete problems.

Also offered as CS 684 and may be taken only once for credit. .
CS 585 - Cryptography (3)
The goal of cryptography is theencoding of information via a cryptographic system. Cryptanalysis studies the breaking of cryptosystems. This coursefocuses on cryptography but with respect to cryptanalysis. An overview of clas sical systems with an in-depth examination of modern cryptosystems. This includes block algorithms such as DES; public-key cryptosystems, such as RSA; and one-way functions. Additionaltopics include cryptographic protocols, signature schemes, pseudorandomnumber generation, Shannon's information theory, and streamciphers.
Also offered for undergraduate-level credit as CS 485 and may be taken only once for credit. .

## CS 586 - Introduction to Database Management Systems (3)

Introduction to fundamental concepts of database management systems using primarily the relational model. Schema design and refinement. Query languages.
Database application developmentenvironments.
Overview of physical data organization, query
optimization and processing, physical design, security, and trans actions used in recovery and concurrency control.
Also offered for undergraduate-level credit as CS 486 and may be taken only once for credit. .

## CS 587 -Database Management Systems Implementation (3)

Internal design of a relational database management system. Concurrency control; lock managers; crash recovery; query and operator evaluation; query optimization; storage management; indexstructures; systemcatalogs.
Also offered for undergraduate-level credit as CS 487 and may be taken only once for credit. . Prerequisite: CS 486/586 and CS 333.

## CS 588 - Cloud and Cluster Data Management (3)

Covers advanced data management solutions emerging for cloud and cluster computing en vironments, focusing on horizontal and vertical scalable approaches. It covers principles behind data management in these environments, plus specific data management systems that are currently in use orbeing developed. The topics range fromnovel
data processing paradigms to commercial data management platforms and open-source NoSQLdatabases. Students will gain broad knowledge about these systems and practical experience with them.
Also offered for undergraduate-level credit as CS 488P and may be taken only once for credit. Prerequisite: CS 586 or consent of the instructor.

## CS 589 - Blockchain Development \& Security (3)

Overview of blockchain systems, how they are built, and how they can be exploited. Students will get hands-on experience working with public blockchains as well as build and deploy permis sioned blockchains. They will then examine security vulnerabilities in blockchain systems and how they may be automatically exploited.

Also offered for undergraduate-levelcredit as CS 489 and may be taken only once for credit.

## CS 590 - Introduction to Multimedia Computing and Networking (3)

Introductory course in multimedia computing and networking intended for senior undergraduate or graduate level students. The objective of this course is to introduce many of the fundamental concepts involved with handling multimedia data and applications. The course will cover (i) basic representation and compression of multimedia data types including H.261, JPEG, and MPEG, (ii) techniques to support multimedia quality-of-service in computing and networked systems, and (iii) networked streaming media techniques such as buffering and adaptation.

Also offered for undergraduate-levelcredit as CS 490 and may be taken only once for credit.

## CS 591 - Introduction to Computer Security (3)

Provides a broad overview of computer security. Provides a solid theoretical foundation, as well as real-world examples, for understanding computer security.
Fundamental theoretical results, foundational models, and salient examples will be covered. Security in computer operating systems, networks, and data will be covered, with emphas is on operating systemand programsecurity.
Also offered for undergraduate-levelcredit as CS 491 and may be taken only once for credit. . Prerequis ite: CS 333, CS 350, C and Java programming.

## CS 592 - Malware Reverse Engineering (3)

Studies the techniques malicious code developers employ to exploit vulnerable computer systems. The course explores the formand function of a range of malware while exploring how the increased mixing of code and data is now exposing us to an array of security vulnerabilities and exploits. Given these threats, the course will then examine modern defenses ag ainst malware and how they can be used to protect users.

Also offered for undergraduate-level credit as CS 492 and may be taken only once for credit. . Prerequisite: Admission into the CS program.

## CS 593 -Digital Forensics (3)

Detailed, hands-on approach to the investigation of criminal incidents in which computers or computer technology play a significant or interesting role. Familiarization with the core computer science theory and practical skills necessary to performrudimentary computer forensic investigations, understanding the role of technology in investigating computer-based crime, and preparation to deal with investigative bodies.
Recommended: CS 333 or CS 533. No prior background in criminal justice or law is assumed.

Also offered for undergraduate-level credit as CS 493 and may be taken only once for credit. .

## CS 594 - Internetworking Protocols (3)

Advanced study of the protocols and algorithms used in the Internet (IETF) family of networking protocols. For example, ARP, IP, UDP, TCP, multicasting, routing protocols like RIP and OSPF, and application protocols like DNS, NFS, SNMP, FTP and HTTP. Issues such as addressing, name service, protocol design, and scalability will be explored.
Also offered for undergraduate-level credit as CS 494 and may be taken only once for credit. .

## CS 595 - Web and Cloud Security (3)

Covers web and cloud systems and how they can be subverted. The class will focus on the highest risk vulnerabilities, givestudents practical experience in how they work, and study how they can be prevented. The class will consist mostly of laboratory exercises focused on developing student skills in performing penetration testing.
Also offered for undergraduate-level credit as CS 495 and may be taken only once for credit.

## CS 596 -Network Security (3)

The class will focus on network security. In order to understand the network security problem, the course will include a review of various forms of network attacks. We will then review basic techniques in applied cryptography, and then secure protocols will be covered including network-layer security and various application-layer secure protocols. Wethen turn to network-side security management including both passive measures like firewall defense schemes including packet filers and bastion hosts, as well as active intrusion detection and res ponse. Finally, we will cover protocols for protecting privacy and anonymity.

Also offered for undergraduate-level credit as CS 496 and may be taken only once for credit. Prerequisite: CS 594.

## CS 597 -Sensor Networks (3)

Foundations of sensor networks, with a focus on activitybased learning through a sequenceof hands-on programming exercises with embedded devices with a high-levelprogramming language. Basic building blocks in designing and deploying a sensor network application. Positioning and time synchronization of networked sensor devices, wireless communication characteristics of lowpowered radios, energy conservation and harvesting, macro-programming a network of sensor devices and security. Recommended prerequisites: Familiarity with computer systems concepts that could be satisfied by CS 200, CS 201. Familiarity with programming in C, C++ or Java. Familiarity with basic concepts in probability and linear algebra that could be satisfied by Mth 301 or equivalent.
Also offered for undergraduate-levelcredit as CS 497 and may be taken only once for credit. .

## CS 598 - Introduction to Wireless Network Protocols

 (3)Classification of wireles s networking systems; study of multiple acces s protocols in single hop and multi-hop networks; performance analysis of protocols; overview of emerging radio technologies for high-throughput next generation systems; study of wireless communication protocol standards for cellular systems; case studies of deployed systems.

Also offered for undergraduate-levelcredit as CS 498 and may be taken only once for credit. . Prerequisite: CS 250 or ECE 271.

## CS 601 - Research (1-12)

(Credit to be arranged.) Consent of instructor.

## CS 602 - Independent Study (1-12)

(Credit to be arranged.)

## CS 603 - Diss ertation (1-12)

(Credit to be arranged.) Consent of instructor.

## CS 604 - Cooperative Education/Internship (1-8)

(Credit to be arranged.) Consent of instructor.

## CS 605 - Reading and Conference (1-8)

(Credit to be arranged.) Consent of instructor.

## CS 606 -Special Projects (1-12)

(Credit to be arranged.) Consent of instructor.

CS 607 -Seminar (1-4)
(Credit to be arranged.)

## CS 610 -Selected Topics (1-8)

(Credit to be arranged.) Consent of instructor.

## CS 653 - Design Patterns (3)

Software design patterns are reusable solutions to recurring software problems. They capture successfulexperiences and convey expert insight and knowledge to less experienced developers. Course provides an in-depth view of patterns using Java as the presentation language. Course is suitable to software architects and developers who are already well-versed in this language. In addition, it offers continuous opportunities for learning the most advanced features of the Java language and understanding some principles behind the design of its fundamental libraries.
Also offered as CS 553 and may be taken only once for credit. . Prerequisite: programming in Java and CS 520.

## CS 655 -Software Specification and Verification (3)

Theoretical and practical as pects of the software development process or software lifecycle. Covers the first part of the cycle: formulating the external requirements, specifying what the software is to do, and the abstract design. Emphasis will be on the formal aspects of specification and verification.
Also offered as CS 555 and may be taken only once for credit.

## CS 656 -S oftware Implementation and Testing (3)

Theoretical and practical as pects of the software development process or software lifecycle. Covers the second part of the cycle: detailed design, implementation in a programming language, testing, and maintenance. Emphasis will be on the technical aspects of soft ware testing.

Also offered as CS 556 and may be taken only once for credit.

CS 658 - Programming Languages (3)
In-depth study of current and his torical is sues in the design, implementation, and application of programming languages. Topics range frombasic to advanced. Areas include syntax, semantics, scoping, typing, abstraction, exceptions, and concurrency. Computational paradigms
such as functional, logic, and/or object oriented are analyzed. Several "recent" programming languages used.

Also offered as CS 558 and may be taken only once for credit. .

## CS 659 - Software Measurement and Models (3)

Survey, evaluation, and application of software measurement techniques and models. Particular emphasis on product metrics such as Software Science, Cyclomatic Complexity, and Function Points.

## CS 668 - Functional Logic Programming (3)

Introduction to functional logic programming. Foundations and basic principles of this paradigmwill be explained in some depth and complemented by encoding practical problems in a functional logic language using a leading compiler/ interpreter. Focus on non-determinis mand computations with incomplete information. Implementation techniques will be briefly discussed.

Also offered as CS 568 and may be taken only once for credit. . Prerequisite: CS 558 Programming Languages.

## CS 669 - ScholarshipSkills for Computer Science and Engineering (3)

The purposeof this course is to make participants better scholars in Computer Science. In particular it attempts to help students become better res earchers, better writers, better presenters, and better reviewers. It concentrates on reading, writing and composition skills: on the production and consumption of the "media" used by computer scientists to communicate professionally. At the completion of the course, students should be familiar with the tasks and activities of modern scholars in computer science.

Also offered as CS 569 and may be taken only once for credit. . Prerequisite: admission into a Ph.D. program within MCECS.

## CS 672 - Operating System Internals (3)

Internals of a specific operating systemincluding structure of the kernel, block buffering cache, file systemstructure and systemcalls, process structure and scheduling, memory management, device driver interface, and inter process communication.
Also offered as CS 572 and may be taken only once for credit. .

## CS 676 - Computer Security Research Seminar (3)

Seminar on emerging topics in computer security.
Also offered as CS 576 and may be taken only once for credit. .

## CS 677 - Modern Language Processors (3)

An advanced courseon compiler construction for modern programming languages, such as object-oriented or functional languages. Topics include type-checking, executable intermediate representations, interpretation and virtual machines, code generation for modern architectures, memory management and garbage collection, and optimization.
Also offered as CS 577 and may be taken only once for credit. . Prerequisite: CS 421.

## CS 678 -Programming Language Semantics (3)

Introduction to the formal mathematical study of program meaning (semantics), using one or more approaches such as operational semantics, denotational semantics, or programming logics. Emphas is on rigorous mathematical development and formal proof techniques. Language features to be studied may includetypes and type safety, purity and imperative effects, functional and modular abstraction, polymorphism, higher-orderfunctions, and object-oriented features. Expected preparation: CS 558 and/orCS 557.

Also offered as CS 578 and may be taken only once for credit. .

## CS 684 - Algorithm Design and Analysis (3)

An advanced in-depth study in the design and analy sis of algorithms. Topics include models of computation, sorting, data structures, graph algorithms, matrix multiplication, fast Fourier transform, polynomial arithmetic, pattern matching, and NP-complete problems.
Also offered as CS 584 and may be taken only once for credit. .

## CS 696 -Network Management and Security (3)

Covers both network management and network security. Net work management will include the design of LANbased net works, including s panning tree protocols, bridge learning protocols, virtual LANs, and Ethernet s witches, and the security of $s$ witches and routers. Network management protocols will be covered in-depth including switch and router management information bases, as well as as sociated SNMP protocols, and network monitoring tools. The second half of the class willfocus on network security. In order to understand the network security problem, the security section will begin with a review of various forms of network attacks. We then turn to networkside security management including both passive measures like firewall defense schemes including packet filers, and bastion hosts. Newer secure protocols will then be covered including network-layer security and various applicationlayer secure protocols.

Prerequisite: CS 594.

## CS 699-Special Studies (1-6)

Credit to be arranged.

## D - Dance

## D 104 - Dance Appreciation (4)

Develop an awareness and appreciation of dance in its artistic, social and cultural contexts through a variety of experiences, viewing and participating in dance. Will cover the basic roles in dance along with concepts and principals such as space, time and effort as well as expression, form, style and period.

## D 193 - Dance Laboratory: Modern I, II, III (2)

Beginning modern dance technique, emphasis on body alignment, strength, flexibility and development of basic technical skills. Maximum: 12 credits .

## D 195 - Dance Laboratory: Topics I, II, III (2)

Beginning dance technique in topics to be named, for example musical theatre, tap, hip hop, etc. Maximum: 12 credits.

## D 196 - Dance Laboratory: Ballet I, II, III (2)

Beginning ballet technique, emphasis on body alignment, development of basic technical skills, and understanding basic ballet vocabulary. Maximum: 12 credits.

## D 197 - Dance Laboratory: Jazz I, II, III (2)

Beginning laboratory in jazz dance technique emphasizing body alignment, contraction, and isolation technique of Latin, West Indian, African and American rhythms. Maximum: 12 credits.

## D 304 - Dance Appreciation (4)

Develop an awareness and appreciation of dance in its artistic, social and cultural contexts through a variety of experiences, viewing and participating in dance. Covers the basic roles involved in dance along with concepts and principals of dance such as space, time and effort as well as expression, form, style and period.
Prerequisite: Upper-division standing.
D 350 - Dance Improvisation (4)
An exploration of spontaneous movement as individual and group creativity and expression, as a potential
performance formand as the beginnings of choreography. "The body thinks." Designed to develop awareness, focus, sensitivity and personal movement vocabularies. Expected preparation: upper division standing.

## D 351 - Dance Composition (4)

Exploration of basic elements of dance and choreographic strategies through readings, observations and preparation of solo dance studies. Expected preparation: upper division standing.

## D 352 - Dance Choreography (4)

Exploring compositional devices and craft unique to group choreography. Choreographing and producing a dancein a performance setting. Expected preparation: D 350, D 351.

## D 355 - Dance Production (4)

Introductory course covering technology for the production of dance. Students will gain a working knowledge of theatre terminology and a familiarity with basic tools and techniques for props, set pieces, costumes, lighting, audio, video, stage management and marketing for a public performance. Students will produce the choreography class concert.

## D 362U - Contemporary Dance 1920 to Present (4)

Historical foundations for the development of current dance forms. Contemporary dancestyles and theories will be studied via lectures and videos, field trips to exhibits and concerts. Expected preparation: upper division standing.

## D 366U - Dance in Film: Early Years through the 1940s (4)

Focus on the Holly wood musical genre, early years of film to 40's, including choreographers, performers, dance styles, what role the dance serves in the films, what defines the genre and how it developed, the social cultural connections, industry practices, dance his tory - popular trends to modern dance. Als ocultural context, concurrent historical events, social trends, innovations, politics.

## D 367U - Dance in Film: 1940s to Present (4)

Focus on dance in popular film, 1948 to present, including choreographers, performers, dance styles, role dance serves in the films, social cultural connections, dance history popular trends to modern dance. Will consider cultural
context --concurrent historical events, social trends, innovations, politics.

## D 393 - Dance Laboratory: Modern I, II, III (2)

Intermediate modern dance technique, emphasis on body alignment, strength, flexibility and development of intermediate leveltechnicalskills. Maximum: 12 credits. Expected preparation: D 193 I, II, III or previous dance experience.

## D 395 - Dance: Topics (2)

Intermediate Dancetechniques in selected topics, for example, Tap, Musical Theater, Hip Hop, African etc.
Prerequisite: D 195.

## D 396 - Dance Laboratory: Ballet I, II, III (2)

Intermediate level ballet technique. Emphas is on execution and application of all basic ballet vocabulary and on alignment and skill development. Maximum: 12 credits.

Prerequisite: low-intermediate technique required; D 196.

## D 397 - Dance Laboratory: Jazz I, II, III (2)

Intermediate laboratory in jazz dance technique emphasizing body alignment, contraction, and is olation technique of Latin, West Indian, and American rhythms. Maximum: 12 credits.
Prerequisite: D 197.

## D 399 - Special Studies (1-12)

(Credit to be arranged.)

## D 402 - Independent Study (1-12)

(Credits to be arranged.)

D 404 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

## D 405 - Reading \& Conference (1-8)

(Credit to be arranged.)

## Des - Design

## Des 100 - Introduction to Communication Design for Non-Majors (4)

Introduction for non-majors to communication design principles and methods used in composition. Lectures, readings, and projects enable creative application of design principles, color theory, and typography. Projects address formal concerns of visual communication design, vis ual literacy, design nomenclature, and design process through methods and strategies for creative problem-solving. Students demonstrate verbal and visual application of a design and compositional vocabulary, an effective design process, and skillfuluse of materials and tools. Projects do not require computer experience.

## Des 111 - Design Thinking (4)

Introduction to the various creative strategies and methodologies designers use in practice. Specific attention is given to problem-solving techniques, and the incorporation of empathy and research within a design process.
Prerequisite: Ins tructor approv al for non-majors.

## Des 120 - Digital Graphics (4)

Digital media is a creative tool for graphic designers. Lectures introduce current and creative practitioners as well as concepts of vector and raster graphics, including digital type, image and device resolution, file formats, and digital print technologies. Creative projects and exercises as sist in developing fluency in computer graphics applications.

## Des 121 - Introduction to Type and Design Principles (4)

Introduction to typography and design principles. Methods, strategies and processes for thinking creatively are investigated through execution in bothtypography and design principles. Emphasis is placed on projects that address design principles, materials and tools.

Prerequisite: Des 120. Concurrentenrollment is permissible.

## Des 125 - Show and Tell (1)

Introduces students to a wide range of practices and practitioners in the field of design. Students will become embedded with professionals in the graphic design community through a series of guest lectures and field trips. This course may be repeated forcredit four times.

## Des 140 - Foundations in Motion, UI, and UX (4)

Introduction to working in digital media. Methods, strategies and processes for thinking creatively are investig ated through execution in both motion graphics and UI/UX (user interface and user-experience) design. Emphasis is placed on projects that address design principles, materials and tools.
Prerequisite: Des 120.

## Des 200 -Digital Page Design I(4)

Studio course introducing single and multi-page document design. Projects embody the entire process of creating a publication fromconcept, through compositional and typographic skills, clear use of hierarchy, and pre-press. Emphas is is placed on work-flow and project management for production of documents in print and electronic media. This course requires that students furnish a laptop computer that meets the departmental standards in terms of hardware and software (see departmental website for requirements). The ideal sequence for design majors is to take Des 200 and 210 before taking Des 224, 225, 254. Open to non-majors with instructor's consent.
Prerequisite: Des 120.

## Des 210 - Digital Imaging and Illustration I (4)

Studio course in digital image creation with an emphasis on raster and vector-based illus tration. Hy brid illustration techniques of mixing handmade work with digital imagery and photography may also be explored. Basic ways in which form communicates meaning are parsed and explored. This course requires that students furnish a laptop computer that meets the departmental standards for hardware and software. See departmental site for requirements. The ideal sequencefor design majors is to take Des 200 and 210 before taking Des 224, 225, 254.
Prerequisite: Des 120.

## Des 224 -Storytelling and Narrative (4)

The theme for this course is narrative structures relating to printed matter and motion. Projects explore visual languages, storytelling, storyboards and the visual es say. Problem solving, idea generation, typography, point of view, conceptual thinking and composition are reinforced. Critical readings, group and individual critiques, and written assignments support vis ual design exploration.
Prerequisite: (Des 121 and Des 120) or (Des 100 and Des 120).

## Des 225 -Design Systems (4)

Introduction to design systems, specifically relating to branding and data visualization. Students develop strong conceptual solutions and systems for managing projects with large amounts of information and branding applications. Emphas is is placed on the expansion of a
strong design process and a continuing to develop a personal visual language. Theoretical approaches, critical readings, group and individual critiques, and written assignments support visual design exploration. Restricted to Graphic Design majors, and Graphic Design and Design Management minors.

Prerequisite: Des 224.

## Des 254 - Typography I (4)

First course in a sequence on ty pography. Builds on the principles introduced in Art 121. Projects focus on typography as mediumand message. Typographic history, including the history of letterforms and the construction and use of grids. Design projects range frompurely textual to problems that require the successful integration of typography and image. Conceptual solutions are emphasized. This course requires that students furnish a laptop computer that meets the departmental standards in terms of hardware and software (see departmental website for requirements).

Prerequisite: Des 121 and Des 120.

## Des 290 - Histories of Graphic Design (4)

Introduces students to the development of graphic forms and typographies starting with ancient civilizations and finishing in the early 21st century. The contexts and ideas that helped shape these histories will be prioritized. Students will develop critical res earch and writing methods to synthesize ideas around design topics of their own interest. Open to non-majors.

## Des 299 -Special Studies (1-8)

(Credit to be arranged.)

## Des 300 - Digital Page Design II (4)

Studio course with an emphasis on typographic grids and systems for presenting mes sages in sequence over multiple pages or screens. Industry standards for design, digital prepress and production practices are examined. This course requires that students furnish a laptop computer that meets the departmental standards in terms of hardware and software (see departmental website for requirements).
Prerequisite: (Des 200, Des 210, Des 225 and Des 254) and instructor approval; OR formal acceptance into the third year by Sophomore Portfolio Review.

## Des 302U- Design is Everywhere (4)

Explores the work of designers and their work in every part of our lives, often invisibly. Shows how designers identify problems, engage with audiences to discover their needs, and craft appropriate solutions by exploring how design thinking strategies can be applied to real-world
scenarios through collaborative, project-based experimentation, readings offering perspectives on designers and design topics, and critiques of design solutions. Course is open to all students, but Graphic Design majors cannot take this course for cluster credit.
Prerequisite: Upper-division standing.

## Des 310 -Digital Imaging and Illustration II (4)

Studio course in advanced composition using photoillus tration, vector illus tration, and hybrid illustration techniques. Emphasis is placed on a conceptual approach to composition and creative process exemplified in the content, style, and execution of illustration projects. This course requires that students furnish a laptop computer that meets the departmental standards in terms of hardware and software (see departmental website for requirements).

Prerequisite: (Des 200, Des 210, Des 225 and Des 254) and instructor approval; OR formal acceptance into the third year by Sophomore Portfolio Review.

## Des 315 -Professional Development (4)

Focus on topics related to professional practices and preparation to enter the field of graphic design. Some profes sional practices covered are: Internship preparation, effective written and verbal presentation, contracts and copyrights, teamdynamics, client meetings, and project management.
Prerequisite: Formal acceptance into the third year by Sophomore Portfolio Review and upper-division standing.

## Des 320 - Information Design (4)

A sequence focusing on concept development and solutions for communication design problems. History, theoretical approaches, ethical design concerns, critical readings, group and individual critiques, and written as signments support visual design exploration. Des 320: Focus is placed on narrativestructures, information design and data visualization. These courses require that students furnish a laptop computer that meets the departmental standards in terms of hardware and software (see departmental website for requirements). This is the first course in a sequenceoftwo: Des 320 and Des 321.

Prerequisite: Formal acceptance into the third year by Sophomore Portfolio Review.

## Des 321 - Brand Lab (6)

A sequence focusing on concept development and solutions for communication design problems. History, theoretical approaches, ethical design concerns, critical readings, group and individual critiques, and written as signments support visual design exploration. DES 321: Projects focus on solving complexcommunication design problems, identity design and branding. This is the second course in a sequenceoftwo: DES 320 and DES 321.

Prerequisite: Des 320.

## Des 333 - Friendtorship: Design, Art and Social Change

 (4)Mentoring high school students through hands on creative projects around themes such as social justice, art literacy and community. This course should be of particular value and interest to students who have a desire to teach and inspire, increasing access to arts learning for under-served teens.

## Des 335 - Screen Printing for Design (4)

Studio course exploring screen printing as partof a design practice. Methods of image preparation to prepare an image for the screen printing process, as well as color mixing, layering shapes and color, scale, halftones and trans parency will be covered. Students will develop a body of work while refining skills as a screen printer. Current and historical references will be investigated. No previous screen printing experience is required.

Prerequisite: (Upper-division standing in the graphic design major and Des 210); or instructor approval.

## Des 340 - Interaction Design Principles (4)

Studio course dealing in the fundamentals of Interaction Design, incorporating the concepts of sound Graphic Design principles with UserExperience processes. Students will examine a series of interfaces, learn to analyze their effectiveness, and create designs that better serve realhuman needs. Topics include User Interface design, Systems Thinking, and User Experience research methods.

Prerequisite: Des 121, Des 120, and instructor approval; OR formal acceptance into the third year by Sophomore Portfolio Review.

## Des 341 - Interactive Media I (4)

Interactive design for the Web focusing on principles of information architecture, navigation systems, and visual interface. HTML/CSS markup and the use of visual design tools. Creation and optimization of graphics in compres sed formats. Introduction to Web production work-flow through development of site projects and a personal portfolio. Topics include usability and the aesthetics of web media. This course requires that students furnish a laptop computer that meets the departmental standards in terms of hardware and software (see departmental website for requirements). Open to nonmajors who have prerequisites and consent of the instructor.
Prerequisite: Des 340; Formal acceptance into the third yearby Sophomore Portfolio Review.

## Des 342 -Interactive Media II (4)

Interactive design that expands on principles of information architecture, navigation systems, and vis ual interface through theexploration of advanced design and development techniques. Advanced Web production workflow will be explored through development of site projects. Critical analys is of work in the field establishes vocabulary and principles for effective design, usability, and interactivity. Technical standards for cross-browser design, client-side scripting, advancedHTML/CSS and basic frame-based web animation. This course requires that students furnish a laptop computer that meets the departmental standards in terms of hardware and software (see departmental website for requirements). Open to nonmajors who have prerequisites and consent of the instructor.

Prerequisite: Des 341 and formal acceptanceinto the third year of the graphic design programby Sophomore Portfolio Review.

## Des 343 - Creative Coding (4)

Studio course exploring code-based approaches for creative projects including generative design and interactivity. Students will work primarily with the open source programming language Processing but will also be exposed to other programming languages and tools. No previous coding experience is required.
Prerequisite: (Des 200, Des 210, Des 225 and Des 254); OR formal acceptance into the third year by Sophomore Portfolio Review.

## Des 345 - Introduction to Motion Graphics for Designers (4)

Motion graphics for graphic designers. Apply compositional and typographic skills to sequentials torytelling, using self-generated graphic and photographic imagery. Emphas is on work flow, storyboards, and clear communication with increasingly conceptual projects. Introduction to essential After Effects skills.
Prerequisite: Formal acceptance into the third year by Sophomore Portfolio Review. Open to non-majors who have prerequisites and consent fromthe instructor.

## Des 353 - Typeface Design (4)

Focus on developing the skills and critical thinking necessary for producing digital typefaces. History, technology and contemporary practices of the industry. Basic lettering skills and theory explored, to aid in the primary focus of creating a functional, flexible and useful typeface.
Prerequisite: Des 254.

## Des 354 - Typography II (4)

The second course in a sequence on typography. An emphas is is placed on developing strong conceptual solutions for complex typographic communication design problems. Continued emphasis is placed on understanding typography within his torical and contemporary contexts. Projects may include multiple page/screen formats, such as books, editorialdesign, campaigns, motion, identity, and websites. This course requires that students furnish a laptop computer that meets the departmental standards in terms of hard ware and software (see departmental website for requirements).
Prerequis ite: Formal acceptance into the third year of the graphic design programby Sophomore Portfolio Review.

## Des 358 - Video, Design \& Community (4)

Focus on collaboration in video production and community-based media. Production of a promotional/informational video for community organizations in Portland. History of community and independent media. Basic video and audio recording, postproduction, interviewing, and group decision-making skills.

Cross-Listed as: This is the same course as Art 358 and may be taken only once for credit.

## Des 367 - Design Business Practices (4)

Introduction to team-based problem-solving practices in communication design. Projects include hy pothetical projects or case studies related to current business problems, is sues, and trends. Emphasis is placed on strategic design and planning, creative process, project management, and studio management. Students demonstrate skills in research, conceptual development, persuasive writing and communication, negotiation, collaboration, and teamdynamics. May be takentwice for credit. Maximum 8 credits. Open to non-majors with instructor's consent.

Prerequisite:For non-majors: Des 224, and Des 290/Des
302U. For Design majors, Des 200, Des 210, Des 225 and Des 254.

Des 399 -Special Studies (1-8)
(Credit to be arranged.)

## Des 402 - Independent Study (1-6)

(Credit to be arranged.)

Des 404 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

## Des 406 -Special Projects (1-12)

(Credit to be arranged.)

## Des 407 -Seminar (1-6)

(Credit to be arranged.)

## Des 408 -Workshop(1-6)

(Credit to be arranged.)

## Des 409 - Practicum(1-12)

(Credit to be arranged.)

## Des 410 -Selected Topics (1-12)

(Credit to be arranged.)

## Des 425 -A+D Projects (4)

Advanced development of graphic design skills with emphasis placed upon conceptual development,research, visual and written messages, multi-task time and materials management, budgets and production. Emphas is will be placed on studio management, teamwork and production.
Prerequisite: Successfully pass the sophomore review. Instructor approval.

## Des 440 - Interactive Team (4)

Interactive media design and development for internal and external community clients. Design solutions are presented, critiqued, and revised based on initial and ongoing client contact. Sites are developed, tested, and maintained on web servers. Team-based design and development process is coordinated through project management practices. Emphas is is placed on strategic and tactical design process, industry standards, usability studies, business proposals, design documents, and other profes sional practices. This course requires that students furnish a laptop computer that meets thedepartmental standards in terms of hardware and software (see departmental website for requirements).
Prerequisite: Des 341 and Des 342.

## Des 441 - Interface Design (4)

Studio course in Interaction Design, with an emphasis on design concepts and techniques in several media including mobile and non-conventional interfaces. Thorough examination of design trends, usability testing and prototyping, and communicating content within the interactive space. Topics include interaction design
patterns, user experience, environmental design, information architecture, and understanding industry standards in UX design.
Prerequisite: Des 340.

## Des 470 - Design Thesis I (4)

Students pursue their own sustained, integrated body of work that demonstrates refinement of visual and verbal communication ideas. This course emphasizes independent working practices along with the role of theory and criticism. This is the first course in a sequence of two: Des 470 and Des 471 and must be taken in sequence.
Prerequisite: Des 320, Des 321 and Des 354.

## Des 471 - Design Thesis II (4)

Students pursue their own sustained, integrated body of work that demonstrates refinement of visual and verbal communication ideas. This course emphasizes independent working practices along with the role of theory and criticis $m$. This is the second course in a sequence of two: Des 470 and Des 471 and must be taken in sequence.

Prerequisite: Des 470.

## Des 472 - Design Portfolio (6)

Development of a design portfolio that presents the creative, conceptual, strategic and technical abilities of the designer. Independent exploration is expected, as well as cons istentand professional written and verbal presentation. Emphasis is placed on professional skills required in the marketplace. Required course for all majors in design.

Prerequisite: Des 321, Des 340, Des 354, Des 470, and senior status in the major.

## EAS - Engineering \& Applied Science

## EAS 101 - Engineering Problem Solving (4)

Introduction to basic ideas and tools used in the engineering profession. Bas ic preparation in rudiments and working methods of engineering design, analysis, and problemsolving, with emphasis on developing skills in computer-aided problemsolving methods utilizing tools such as MATLAB, Mathcad, and EXCEL. Introduction to structured computer programming methods via MATLAB scripting language. Lecture and recitation.
Prerequisite: Mth 112.
EAS 101R - Recitation: Engineering ProblemSolving (0)

Recitation forEAS 101 Engineering ProblemSolving. Corequisite: EAS 101.

## EAS 102 - Engineering Computation Structures (4)

Introduction to advanced data structures useful for solving engineering problems. Continues developing skills in the algorithmic method for engineering problemsolving. Modern programming language. Recommended prerequisite: EAS 101.

## EAS 115 - Engineering Graphics (3)

The graphic language applied to engineering. Projection sy stems. Multiview and pictorial representation. Introduction to computer graphics. Lecture and laboratory.

## EAS 115L - Engineering Graphics Lab (0)

Lab for EAS 115 Engineering Graphics.
Corequisite: EAS 115.
EAS 199 - Special Studies (1-4)
(Credit to be arranged.) Consent of instructor.

## EAS 211 - Statics (4)

Principles and applications of static equilibriumto structures and machines.

Prerequisite: (must be passed with grade of "C" or better): Mth 252; Ph 211 or Ph 221 (may be taken concurrently with EAS 211). (Ph 211 or Ph 221 may be taken concurrently with EAS 211).

## EAS 212 - Strength of Materials (4)

Study of the relationship bet ween strain and stress in deformable bodies; principles of stress analy sis for axial force, flexure, torsion, and shear; studies in combined stres ses and column stability.
Prerequisite: (must be passed with grade of "C" or better): EAS 211; Ph 211 or Ph 221.

## EAS 215 - Dynamics (4)

Fundamental principles and methods of Newtonian mechanics including kinematics and kinetics of motion and the conservation laws of mechanics. Basic particle and rigid body applications.
Prerequisite: (must be passed with grade of "C" or better): EAS 211, Mth 252, Mth 261.

## EAS 333U- Problems, Solutions, andSystems Thinking

 (4)Provides the basis of systems thinking, foundational in addressing modern challenges. Develops skills, through diverse teamand individual exploration in real-world applications, to assist in understanding vague problems,
examine causes and solutions to complexscenarios. Gives an appreciation of systems thinking and the foundational philosophy of a modern learning org anization.

## EAS 401 - Research (1-6)

(Credit to be arranged.) Consent of instructor.

## EAS 405 - Reading and Conference (1-6)

(Credit to be arranged.) Consent of instructor.

## EAS 406 - Special Projects (1-6)

(Credit to be arranged.) Consent of instructor.

## EAS 407 - Seminar (0-6)

(Credit to be arranged.) Consent of instructor.

## EAS 410 - SelectedTopics (1-6)

(Credit to be arranged.) Consent of instructor.

## EAS 461 - Reliability Engineering (4)

Design of reliable components and systems for engineering fields. Includes elements of probability and statistics, reliability, mathematics, failure modes and effect analysis; and des ign for given reliabilities under constraints.
Also offered for graduate-level credit as EAS 561 and may be taken only once for credit. . Prerequisite: senior standing in engineering.

EAS 507 - Seminar (1-6)
(Credit to be arranged.)

## EAS 510 - SelectedTopics (1-6)

(Credit to be arranged.)

## EAS 561 - Reliability Engineering (4)

Design of reliable components and systems for engineering fields. Includes elements of probability and statistics, reliability, mathematics, failure modes and effect analysis; and design for given reliabilities under constraints.

Also offered for undergraduate-level credit as EAS 461 and may be taken only once forcredit. . Prerequis ite: senior standing in engineering.

## Ec - Economics

## Ec 200 - Contemporary Economic Issues (4)

Introduction to the economic approach to current political and economic is sues. Topics will vary depending upon the instructor, but may include markets and competition, sustainable development and growth, poverty and inequality, government policy, international economic relationships, the economic approach to environmental protection.

## Ec 201 - Principles of Microeconomics (4)

A study of the choices individuals face as participants in the markets for goods, services and factors of production like labor; behaviorof profit-maximizing firms operating in markets with varying degrees of competitive pressure; potential role of government in intervening to influence market outcomes using taxes and subsidies; reas ons for international trade and economic inequality.

## Ec 201H- Honors Principles of Microeconomics (4)

A study of the market system, involving the essentials of demand and supply analysis; competition and monopoly; labor public policy toward business; the distribution of income; international trade and commercial policy; comparative advantage, tariffs, and quotas.

## Ec 202 - Principles of Macroeconomics (4)

A study of factors affecting the level of national income: the essentials of money and banking; the role of government expenditure and taxation in achieving economic stability, growth, and development; international monetary issues including exchange rates and thebalance of payments.
Prerequisite:Ec 201.

## Ec 202H- Honors Principles of Macroeconomics (4)

A study of factors affecting the levelof national income: the essentials of money andbanking; the role of government expenditure and taxation in achieving economic stability, growth, and development; international monetary is sues including exchange rates and thebalance of payments.

## Ec 299 -Special Studies (1-12)

(Credit to be arranged.)

## Ec 311 - Microeconomic Theory (4)

Theories of consumer behavior and demand, production and cost, the firm and market organization, strategic behavior, and functional income dis tribution. Course may not be taken for credit if taken after completion of, or concurrently with, EC 415 .

Prerequisite: Ec 201.

## Ec 312 -Macroeconomic Theory (4)

Tools and models to analyze factors influencing the levels of output, employment and prices. Fundamentals of the theory of business cycles, economic growth, and inflation. The role of government in solving macroeconomic problems.
Prerequisite:Ec 202; Ec 311 or Ec 415 or concurrent enrollment. Concurrent enrollment only allowed forEc 311 or Ec 415.

## Ec 314U - Private and Public Investment Analysis (4)

Examines the tools required to analyze expenditures that yield benefits over time-investments. The use of accounting documents and a focus on the time value of money allows students to analyze choices in a variety of security, loan, and equipment investment decisions.

## Ec 316U - Introduction to Health Care Economics (4)

Provides an introduction to basic economic concepts that are most relevant to the study of the health care system. Examines the efficiency and equity implications of providing health care under the traditional fee-for-service systemvers us providing health care under the relatively new systems of health care delivery such as health maintenanceorganizations (HMOs), preferred provider organizations (PPOs), etc. Compares the Americanhealth care system to the systems employed in other developed countries. Special attention will be paid to the delivery of health care in Oregon.

## Ec 321U - Fundamentals of Game Theory (4)

Introduction to the theory of games and their applications in economics. Examines how some broad classes of games can be used to study the strategic choices of economic agents under circumstances of imperfect competition and/orinformation.

## Ec 325-Latin American Economics (4)

By means of discussions, presentations, and lectures this course tackles common themes that characterize Latin America: economic growth barriers, the curse of commodities, import substitution industrialization, trade policy, exchange rate policy, public debt management,
macroeconomic stability, and the poverty and inequality vicious cycle.

Prerequisite: Consentof instructor.

## Ec 332U- Economics of Environmental Issues (4)

Examines several local, national and globalenvironmental is sues. Students will be introduced to some basic economic concepts and tools fundamental to understanding the social, economic and environmental impacts of current and proposed environmental policies.

## Ec 340 - International Economics (4)

Examines trade and financial relations among countries with an emphasis on policy perspectives. Outlines international policy options and the principles that govern world trade and financial arrangements. Regional and international trade organizations and currency arrangements will be discussed. Credit is not given for both Ec 340 and Ec 440 or Ec 441.

## Ec 345 -Marxist Political Economy (4)

An inquiry into the contribution to social and economic thought advanced by Karl Marx. Based on reading and interpreting primary sources. Considers the legacy of Marx's ideas on the course of his tory in the 20th century, and the potential influence in the 21 st century.

## Ec 350U- Economics of Developing Countries (4)

The economics of most of the world. Examines the concept and history of development, the causes of economic growth, poverty and inequality, population growth, education and health, su stainable development, the impact of international trade, and foreign aid.

## Ec 380 - Introduction to Mathematical Economics (4)

Economic concepts are explored using mathematical methods. Applications are drawn froma wide range of fields in economics including microeconomics, macroeconomics, economic growth, international trade, internationalfinance, labor and en vironmental economics, indus trial org anization and development economics. Mathematical methods utilized include equations, functions, sets, total and partial differentiation, and linear algebra.

Prerequisite: Mth251, Ec 201, Ec 202.
Ec 399 - Special Studies (1-6)
See department for course description. (Credit to be arranged.)

## Ec 401 - Research (1-6)

Consentof instructor. See department for course description. (Credit to be arranged.)

## Ec 402 - Independent Study (1-12)

(Credit to be arranged.)

## Ec 403 -Honors Thesis (1-4)

Consent of instructor. See department for course description. (Credit to be arranged.)

## Ec 404-Cooperative Education/Internship (1-12)

By prior arrangement with a faculty member, economics majors may integrate their practical experience with an economics is sue into their academic education. Students are expected to provide a brief proposal of the topic they wish to pursue, demonstrating some familiarity with the economics literature in the area and the way in which their internship or other experience will illus trate practical aspects of the proposed topic. Evaluation on the basis of written and orals syntheses of academic and practical knowledge. Only in unusual circumstances will more than 4 credits be granted for cooperativeeducation/internship.
Prerequisite: Ec 201, Ec 202, and consent of instructor. (Credit to be arranged.).

Ec 405 - Reading and Conference (1-6)
Consentof instructor. See department for course description. (Credit to be arranged.)

## Ec 407 -Seminar (1-6)

Consentof instructor. See department for course description. (Credit to be arranged.)

## Ec 409 - Practicum (1-3)

By prior arrangement with the department, economics majors may receive a maximum of 3 credits in their total undergraduate programforeconomics research done in the community in conjunction with guided reading and regular consultations with the practicuminstructor. Recommended prerequisites: $\mathrm{Ec} 201,202$, and consent of instructor. (Credit to be arranged.)

## Ec 410 -SelectedTopics (1-6)

See department for course description. (Credit to be arranged.)

## Ec 415 -Microeconomic Theory with Calculus (4)

Mathematical analy sis of consumers, firms and markets. Uncertainty, Game Theory, Partial Equilibrium Analysis, General Equilibrium Analy sis and Welfare. Economics majors take either Ec 311 orEc 415 . Ec 415 cannotbe used as anelective in the economics major.
Prerequisite: Ec 201, and Ec 380 or Mth 251.

## Ec 417 - Women in the Economy (4)

Different economic theoretical perspectives are presented to account for women's particular economic roles currently and historically. Emphas is on women's res ponsibility for child rearing and housework; women's relatively low wages; occupational segregation by gender; economic differences among women due to ethnicity, generation, and class; and policy is sues with particular importance for women's economic situation. Expected preparation: Ec 201.

Also offered for graduate-level credit as Ec 517 and may be taken only once forcredit. .

## Ec 418 - Economics Department Seminar (1)

Economics majors, minors, graduate students and other students currently enrolled in an economics course may enroll in the Economics DepartmentSeminar, which brings academic and professional economists to campus to present research on a wide variety of topics, using the spectrumof methodological approaches.
Also offered for graduate-level credit as Ec 518. Prerequisite: junior standing.

## Ec 419 - Economics of Race and Ethnicity (4)

Survey of the economic history of ethnic groups in the United States, various economic theoretical pers pectives advanced to account for past and current experience of people of color in the U.S. economy, and examination of selected economic policy issues. Expected preparation: Ec 201.

Also offered for graduate-level credit as Ec 519 and may be taken only once for credit. .

## Ec 420 - Money and Banking (4)

Functional and empirical definitions of money and interest rates. Characteristics and role of bank and non-bank financial institutions in determining the level of money and interest rates. History of the Federal Reserve System. Instruments of monetary control by the Federal Reserve. Alternative models of monetary influence on the economy.

Also offered for graduate-level credit as Ec 520 and may be taken only once for credit. . Prerequisite: Ec 201, Ec 202, Ec 312 or consent of instructor.

## Ec 425 - Economics of Industrial Organization (4)

Application of microeconomic theory to analysis of firms, markets, and industries. Economic explanations for structure of markets and behavior of firms that trade in them. Internal organization of firms and assessment of efficiency of markets in determining organization.
Also offered for graduate credit as Ec 525 and may be taken only once for credit. . Prerequisite: Ec 201; Ec 311 or Ec 415, or consent of instructor.

## Ec 426 - Economics of Regulation (4)

Study of government regulation designed to control-or at least to influence-the performance of the market in specific ways. Historical and economic analyses of three main forms of regulation: direct regulation of monopoly and competition, and social regulation to protect the environment and the individual. Expected preparation: Ec 201.

Also offered for graduate credit as Ec 526 and may be taken only once for credit. .

## Ec 427-Cost-Benefit Analysis (4)

Main theory and empirical methodologies for as sessing costs and benefits of projects with varying timeframes and levels of uncertainty. Focus on public projects, including environmental, infrastructure and social service activities. Methodologies for valuation of nonmarket goods, such as environmental services, als o covered.
Also offered for graduate-level credit as Ec 527 and may be taken only once for credit. . Prerequisite: Ec 201.

## Ec 428 -Project Evaluation (4)

Methodology for programevaluation fromneeds as sessment through outcome and effectiveness evaluation. Heavy reliance on case studies. Students may participate in ongoing evaluations.
Also offered for graduate-level credit as Ec 528 and may be taken only once for credit. . Prerequisite: Ec 311, Ec 415 or consent of ins tructor.

## Ec 430 - Resource and Environmental Economics (4)

Overview of different approaches to economic analysis of resources and environment, and fundamental issues of economy/environment interactions, as well as the emerging subject of sustainability. Covers the basics of standard environmental and resource economics including the theory of externalities, res ource allocation over time, common property res ources, public goods and valuation. Includes an overview of the economic dimension of policies designed to protect and improve environmental
quality and protect and efficiently manage natural resources.

Also offered for graduate credit as Ec 530 and may be taken only once for credit. . Prerequisite: Ec 201.

## Ec 431 - Urban Economics (4)

Functions of the urban economy; the market sector and the public sector. Land use, environmental quality, trans portation, housing, income distribution, the org anization and financing of urban public services. This is the same course as USP 431 and RE 431 and may be taken only once for credit. Expected preparation: Ec 201, Ec 202.

Also offered for graduate credit as Ec 531 and may be taken only once for credit. Prerequisite: Upper-division standing. Cross-Listed as: USP 431 and RE 431.

## Ec 432 - Advanced Environmental Economics (4)

Examination of the economics of environmental degradation, externalities and pollution control. Emphas is is on the theoretical as pects of market failure, policies/regulations to promote efficient outcomes and policy applications. Expected preparation: Ec 469 or equivalent.
Also offered for graduate-level credit as Ec 532 and may be taken only oncefor credit. .Prerequisite: Ec 311 or Ec 415 , and Ec 430 or permis sion of instructor.

## Ec 433 - Advanced Natural Resource Economics (4)

Analyze natural resource production, extraction and use. Focus on resources such as land, minerals, forests, fisheries and wild life. Problems achieving sustainability. Regional, national and international case studies used to illus trate key policy is sues. This is the same course as ESM 433 and may be taken only once for credit. Recommended preparation: Ec 469.

Also offered for graduate-level credit as Ec 533 and may be taken only once for credit. Prerequisite: Ec 311 or Ec 415, and Ec 430 or Ec 530. Cross-Listed as: ESM 433.

## Ec 434 - Business Environmental Management Economics (4)

Examines the economic costs and benefits that affect the decisions of business firms to develop integrated environmental management systems. Analysis of policy options to foster business environmental management for public goods. Case studies of selected firms. This is the same course as ESM 434 and may be taken only once for credit. Recommended: Ec 201.

Also offered for graduate-level credit as Ec 534 and may be taken only once forcredit. Cros s-Listed as: ESM 434.

## Ec 435 - Public Spending and Debt Policy (4)

Analysis of the role of the statein a competitive economy. Development of decision rules forstate economic action.

Includes a detailed study of the principles of voting, public budgeting including cost benefit analysis and PPBS, the theory of fiscal federalis mand the theory and principles of public debts. Recommended: Ec 201, 202.
Also offered for graduate-level credit as Ec 535 and may be taken only once for credit. . Prerequisite: Ec 415 or (Ec 311 and Mth 251).

## Ec 436 - Taxation and Income Policies (4)

Principles and problems of government financing. Critical analys is of alternative taxes as sources of public revenue with emphas is on theories of incidence andeconomic effect. Recommended: Ec 201, Ec 202.
Also offered for graduate-level credit as Ec 536 and may be taken only once for credit. .

## Ec 437 - Public Utility Economics (4)

Examines the rationale, economic principles, and institutions of his toric economic regulation. Contemporary theory of the firm and regulatory practice with a focus on energy are analyzed.

Also offered for graduate-level credit as Ec 537 and may be taken only once for credit. . Prerequisite: Ec 311 or Ec 415.

## Ec 438 - Energy Economics (4)

Economics and structure of energy markets, with a focus on electricity. Examines current policy is sues arising from energy production and use.

Also offered for graduate-level credit as Ec 538 and may be taken only once for credit. . Prerequisite: Ec 311 or Ec 415.

## Ec 440 - International Trade Theory and Policy (4)

Theories of international trade. Analysis of the normative aspects of trade including the gains fromtrade and the effect of trade on economic welfare. Examination of international trade policy and is sues of economic integration, economic growth, and current trade problems.

Also offered for graduate-level credit as Ec 540 and may be taken only oncefor credit. . Prerequisite: Ec 201; Ec 311 or Ec 415 or consent of instructor.

## Ec 441 - International Monetary Theory and Policy (4)

Balance of payments theory including balance of payments accounting and foreign exchange market; theoretical models of fixed and flexible exchange rate systems using both Neoclassical and Keynesian approaches. His torical evolution of the international monetary system. Current international monetary policies and problems.
Also offered for graduate-level credit as Ec 541 and may be taken only once for credit. . Prerequisite: Ec 201, Ec 202; Ec 312 or consent of instructor.

## Ec 442 - The Multinational Enterprise in the World Economy (4)

The study of the multinational(transnational) enterprise as a form of direct foreign investment. Analysis of theories of direct investment; the impact of the multinational enterprise on the national and international economy and the relationship of such firms to the concept of the nationstate. Recommended:Ec 201, Ec 202.
Also offered for graduate-level credit as Ec 542 and may be taken only once for credit. .

## Ec 443 - Global Environmental Economics (4)

An examination of economic forces and theories to understand the causes of global environmental problems and evaluate policy options. Primary emphasis is on developing countries and countries in transition, though linkages with developed countries also considered. Topics include poverty, population, economic development and the environment, global warming, biodiversity protection, sustainability, and pollution control. This is the same course as ESM 443 and may be taken only once for credit.

Also offered for graduate-level credit as Ec 543 and may be taken only once for credit. Cross-Listed as: ESM 443.

## Ec 444 - Economics of Green Power (4)

The economic feasibility and rationale of producing electricity us ing several alternative environmentally friendly technologies. The economic and environmental costs and benefits of employing these technologies are identified and compared to the dominant technologies (coal, oil, hydropower). Alternative policies that provide incentives for the adoption of greentechnologies are examined. Recommended: Ec 201.

Also offered for graduate-level credit as Ec 544 and may be taken only once forcredit. .

## Ec 445-Comparative Economic Systems (4)

Introduces the evolutionary-institutional method of analys is, incorporating history, the legacy of ideas, and the dynamics of change overtime. Using this method, we shall examine economic systems of Ancient Rome, Medieval Feudalism, the Laissez-Faire Market Economy, Fascist Command Economy, and others. Recommended: Ec 201, 202.

Also offered for graduate-level credit as Ec 545 and may be taken only once forcredit. .

## Ec 446 - Institutional Economics (4)

Considers the contributions of seminal thinkers to what is reg arded as an alternate or heterodoxs chool in economic science. Contribution of Thornstein Veblen, John R. Commons, Wes ley Mitchell, Simon Kuznets, Clarence Ayres, Gunnar Myrdal, and John Kenneth Galbraith, as well as more contemporary thinkers will be explored.

Institutional theory will be compared and contrasted with neoclassical economics, and shown as a viable theory posing a formidable challenge to the dominant paradig mof orthodoxy. Neo-institutionalist challenges will also be considered.

Also offered for graduate-level credit as Ec 546 and may be taken only oncefor credit.

## Ec 447 - Economics of Transition (4)

Examines the formation of the Soviet-type economic systemin the 1920s and 30s and its dis semination after W orld W ar II to Eastern Europe, China, and other selected countries. Emphasis is placed on the history of ideas and the his torical setting which gave rise to the Soviet model. Includes the examination of the internal contradictions of the model, the "unwinding" of planned socialism, and the prospects for the move to ward mixed market economies. Recommended: Ec 201, Ec 202.
Also offered for graduate-level credit as Ec 547 and may be taken only once for credit. .

## Ec 448 - East Asian Economic Development (4)

Key topics in the development of East A sianeconomies, especially, Japan, China, South Korea, and several Southeast Asian countries. Economic theory will be applied to investigate the validity of the "Asian economic growth model," while examining political, social and historical factors of the area and comparing the experience of theseeconomies with that of other developing countries.

Also offered for graduate-level credit as Ec 548 and may be taken only once for credit.

## Ec 450 - Economics of Development (4)

Examines problems of post-colonial legacy: underdevelopment and persistent poverty. Rapid population growth, uneven development, capital flight, dualeconomy, brain drain. Industrialization strategies, foreign trade, education and human capital, population slowdown, microcredit institutions, role of women.
Also offered for graduate-level credit as Ec 550 and may be taken only once for credit. . Prerequisite: Ec 201, 202.

## Ec 453 - Theory of Economic Growth (4)

Introduction to the theory of economic growth. This course will emphasize the theoretical basis and the models developed to measure growth and change in modern industrial societies. Recommended:Ec 201, 202.

Also offered for graduate-level credit as Ec 553 and may be taken only once for credit. .

## Ec 456 - American Economic History: the First Century (4)

The economic background of the W ar of Independence and the seeds of the Civil W ar. Industrialization, urbanization,
and development of the frontier. Rise of big business and org anized labor. Laissez-faire, federalism, and the gradual emergence of the national government in economic policy. Changes in foreign trade and in the international position of the U.S. Recommended: Ec 201, 202.

Also offered for graduate-level credit as Ec 556 and may be taken only once for credit. .

## Ec 457 - American Economic History: the 20th Century (4)

Economic impact of U.S. involvement in W orld War I. Postwar structural changes. Waning of laissez-faire. Causes of the Great Depression. Economic policies of Hoover and Roosevelt administrations. The New Deal reforms. World War II and emergence of the administered system. Evolution of the mixed economy and growing role of the government. The industrial military complex. Social imbalance. Recommended: Ec 201, 202.

Also offered for graduate-level credit as Ec 557 and may be taken only once for credit. .

## Ec 460 - History of Economic Thought (4)

Selections fromthe economic writings of various thinkers from antiquity through the Reformation. A survey of the work of the most important economic theoris ts of the 18th, 19th, and 20th centuries including AdamSmith, Ricardo, Marx, Marshall, Veblen, and Keynes. Readings include original writings and interpretations by later economists. Scholars will be studied in terms of their historical context and the contemporary relevance of the theories and policy recommendations.
Also offered for graduate-level credit as Ec 560 and may be taken only once for credit. .

## Ec 465 - Labor Economics (4)

This course investigates the determinants of wages, the decision to work, the reasons demographic groups fare differently in the labor market, and sources of unemployment. Also considers current developments in labor markets of increas ing wage inequality, globalization, declining unionization, and widespread useof new technologies.
Also offered for graduate-level credit as Ec 565 and may be taken only once for credit. . Prerequisite: Ec 415 or (Ec 311 and Mth 251).

## Ec 469 - Introduction to Econometrics (4)

General survey of empirical techniques useful for economic analysis. Focus on the applications of mathematical tools and regression analysis in economics. Quantitative topics will be introduced systematically with hands-on case studies and examples related to the fields of economics, public policy, and urban studies. This course will not be counted as credit foreconomics graduate
students, butmay be taken by graduate students in other programs.
Also offered for graduate-level credit as Ec 569 and may be taken only oncefor credit. . Prerequisite: Mth 251, Stat 243 and Stat 244.

## Ec 472 - Time Series Analysis and Forecasts (4)

Time series analysis, emphasizing model identification, estimation, and forecasting. Non-stationary time series analys is includes unit root and cointegration tests. Techniques of moving average, differencing, and autocorrelation adjustment are introduced. Diagnostic checking following the model evaluation provides the base model for forecasting. Expected preparation: Ec 370. This course assumes background knowledge of linear regression, algebra, probability theory, statistical inference, distribution theory, hypothesis testing, introductory calculus (slopes, derivatives, maximization, and minimization) and matrix algebra.

Also offered for graduate-level credit as Ec 572 and may be taken only once for credit. . Prerequisite: Ec 469.

## Ec 476 - Implementing Econometrics using Stata and R (4)

Nuts and bolts techniques for implementing econometric analys is using Stata software, the R statistical package and a short introduction to SAS. Topics include org anizing data, non parametric s moothing, graphing techniques, regression diagnostics, Stata and Mata programming. Preparation: an econometrics course or statistics courses including regression analysis.
Also offered for graduate-level credit as Ec 576 and may be taken only once for credit. Prerequisite: Ec 469 or Ec 570 or permission of the instructor.

## Ec 480 - Mathematical Economics (4)

Mathematics for Economists. Application of differential calculus and matrix algebra to economics. Topics include cons umer theory, production functions, and applied general equilibriummodels.
Also offered for graduate-level credit as Ec 580 and may be taken only oncefor credit. . Prerequisite: Ec 311 or Ec 415; Ec 312, and Ec 380 (or equivalently: Mth 251, Mth 252, and Mth 261, in place of Ec 380).

## Ec 501 - Research (1-9)

Consentof instructor. See department for course description. (Credit to be arranged.)

## Ec 503 - Thesis (1-9)

See department for course description. (Credit to be arranged.)

## Ec 504-Cooperative Education/internship(1-9)

By prior arrangement with a faculty member, economics majors may integrate their practical experience with an economics issue intotheir academic education. Students are expected to provide a brief proposal of the topic they wish to pursue, demonstrating some familiarity with the economics literature in the area and the way in which their internship orother experience will illustrate practical aspects of the proposedtopic. Evaluation on the basis of written and orals syntheses of academic and practical knowledge. Only in unusual circums tances will more than 4 credits be granted for cooperative education/internship.
Prerequisite: Ec 201, Ec 202, and consent of instructor. (Credit to be arranged.).
Ec 505-Reading and Conference (1-6)
Consent of instructor. See department for course description. (Credit to be arranged.)

## Ec 506 -Special Projects (1-9)

(Credit to be arranged.)

## Ec 507 -Seminar (1-6)

Consentof instructor. See department for course description. (Credit to be arranged.)

## Ec 510-SelectedTopics (1-5)

See department for course description. (Credit to be arranged.)

## Ec 517 - Women in the Economy (4)

Different economic theoretical perspectives are presented to account for women's particulareconomic roles currently and his torically. Emphas is on women's responsibility for child rearing and housework; women's relatively low wages; occupational segregation by gender; economic differences among women due to ethnicity, generation, and class; and policy iss ues with particular importance for women's economic situation.
Also offered for undergraduate-levelcredit as Ec 417 and may be taken only once for credit. .

## Ec 518 - Economics Department Seminar (1)

Economics majors, minors, graduate students and other students currently enrolled in an economics course may enrollin the Economics DepartmentSeminar, which brings academic and professional economis ts to campus to present researchon a wide variety of topics, using the spectrumof methodological approaches.

Also offered for undergraduate-level credit as Ec 418. .
Ec 519 - Economics of Race and Ethnicity (4)
Survey of the economic history of ethnic groups in the United States, various economic theoretical perspectives advanced to account for past and current experience of people of color in the U.S. economy, and examination of selectedeconomic policy issues.
Also offered for undergraduate-level credit as Ec 419 and may be taken only once for credit. .

## Ec 520 - Money And Banking (4)

Functional and empirical definitions of money and interest rates. Characteris tics and role of bank and non-bank financial institutions in determining the level of money and interest rates. History of the Federal Reserve System. Instruments of monetary control by the Federal Reserve. Alternative models of monetary influence on the economy.
Also offered for undergraduate-level credit as Ec 420 and may be taken only once for credit. .

## Ec 522 - Economics of Sustainability: Theory and Practice (4)

Economic concepts and theories for analyzing sustainable development, including the emerging field of ecological economics. Roles and practices of the business, government and nonprofit sectors in fostering sustainability.

## Ec $\mathbf{5 2 5}$ - Economics of Industrial Organization (4)

Application of microeconomic theory to analysis of firms, markets, and industries. Economic explanations for structure of markets and behavior of firms that trade in them. Internal organization of firms and assessment of efficiency of markets in determining organization.
Also offered for undergraduate credit as Ec 425 and may be taken only once for credit.

## Ec 526 - Economics of Regulation (4)

Study of government regulation designed to control-or at least to influence-the performanceof the market in specific ways. Historical and economic analyses of three main forms of regulation: direct regulation of monopoly and competition, and social regulation to protect the environmentand the individual.
Also offered for undergraduate credit as Ec 426 and may be taken only once for credit. .

## Ec 527 - Cost-Benefit Analysis (4)

Main theory and empirical methodologies for as sessing costs and benefits of projects with varying time frames and levels of uncertainty. Focus on public projects, including environmental, infras tructure and social service activities.

Methodologies for valuation of nonmarket goods, such as environmental services, also co vered.

Also offered as undergraduate-level credit as Ec 427 and may be taken only once for credit. .

## Ec 528 - Project Evaluation (4)

Methodology for programevaluation fromneeds as sessment through outcome and effectiveness evaluation. Heavy reliance on case studies. Students may participate in ongoing evaluations.
Also offered for undergraduate-levelcredit as Ec 428 and may be taken only once for credit.

## Ec 530 - Resource and Environmental Economics (4)

Overview of different approaches to economic analy sis of resources and environment, and fundamental issues of economy/environment interactions, as well as the emerging subject of sustainability. Covers the basics of standard environmental and resource economics including the theory of externalities, resource allocation over time, common property resources, public goods and valuation. Includes an overview of the economic dimens ion of policies designed to protect and improve environmental quality and protect and efficiently manage natural resources.

Also offered for undergraduate credit as Ec 430 and may be taken only once for credit. .

## Ec 531 - Urban Economics (4)

Functions of the urban economy; the market sector and the public sector. Land use, environmentalquality, trans portation, housing, income distribution, the org anization and financing of urban public services.
Also offered for undergraduate credit as Ec 431 and may be taken only once forcredit.

## Ec 532 - Advanced Environmental Economics (4)

Examination of the economics of environmental degradation, externalities and pollution control. Emphas is is on the theoretical as pects of market failure, policies/regulations to promote efficient outcomes and policy applications.
Also offered for undergraduate-levelcredit as Ec 432 and mayb taken only once for credit.

## Ec 533 - Advanced Natural Resource Economics (4)

Analyze natural resource production, extraction and use. Focus on resources such as land, minerals, forests, fisheries and wildlife. Problems achieving sustainability. Regional, national and international case studies used to illustrate key policy is sues. This is the same course as ESM 533 and may be taken only once forcredit.

Also offered for undergraduate-level credit as Ec 433 and may be taken only once for credit. Cross-Listed as: ESM 533.

## Ec 534 - Business Environmental Management Economics (4)

Examines the economic costs and benefits that affect the decisions of business firms to develop integrated environmentalmanagement systems. Analysis of policy options to foster business environmental management for public goods. Case studies of selected firms.
Also offered for undergraduate-level credit as Ec 434 and may be taken only once for credit. . Cross-Listed as:ESM 534.

## Ec 535 - Public Spending and Debt Policy (4)

Analysis of the role of the state in a competitive economy. Development of decision rules forstate economic action. Includes a detailed study of the principles of voting, public budgeting including cost benefit analysis and PPBS, the theory of fiscal federalis mand the theory and principles of public debts.
Also offered for undergraduate-level credit as Ec 435 and may be taken only once for credit. .

## Ec 536 - Taxation and Income Policies (4)

Principles and problems of government financing. Critical analys is of alternative taxes as sources of public revenue with emphas is on theories of incidence and economic effect.
Also offered for undergraduate-level credit as Ec 436 and may be taken only once for credit. .

## Ec 537 - Public Utility Economics (4)

Examines the rationale, economic principles, and institutions of his toric economic regulation. Contemporary theory of the firm and regulatory practice with a focus on energy are analyzed. Expected preparation:Ec 311, Ec 314 or Ec 581.
Also offered for undergraduate-level credit as Ec 437 and may be taken only once for credit. .

## Ec 538 - Energy Economics (4)

Economics and structure of energy markets, with a focus on electricity. Examines current policy is sues arising from energy production and use. Expected preparation: Ec 311, Ec 415 or Ec 581.
Also offered for undergraduate-level credit as Ec 438 and may be taken only once for credit.

## Ec 540 - International Trade Theory and Policy (4)

Theories of international trade. Analysis of the normative aspects of trade including the gains fromtrade and the effect of trade on economic welfare. Examination of
international trade policy and is sues of economic integration, economic growth, and current trade problems.

Also offered for undergraduate-levelcredit as Ec 440 and may be taken only once for credit.

## Ec 541 - International Monetary Theory and Policy (4)

Balance of payments theory including balance of payments accounting and foreign exchange market; theoretical models of fixed and flexible exchange rate systems using both Neoclassical and Keynesian approaches. Historical evolution of the international monetary system. Current international monetary policies and problems.

Also offered for undergraduate-levelcredit as Ec 441 and may be taken only once for credit. .

## Ec 542 - The Multinational Enterprise in the World Economy (4)

The study of the multinational(transnational) enterprise as a form of direct foreign investment. Analysis of theories of direct inves tment; the impact of the multinational enterprise on the national and international economy and the relationship of such firms to the concept of the nationstate.
Also offered for undergraduate-levelcredit as Ec 442 and may be taken only once for credit. .

## Ec 543 - Global Environmental Economics (4)

An examination of economic forces and theories to understand the causes of global environmental problems and evaluate policy options. Primary emphasis is on developing countries and countries in transition, though linkages with developed countries also considered. Topics include poverty, population, economic development and the environment, global warming, biodiversity protection, sustainability, and pollution control. This is the same course as ESM 543 and may be taken only once forcredit.
Also offered for undergraduate-levelcredit as Ec 443 and may be taken only once for credit. Cross-Listed as: ESM 543.

## Ec 544 - Economics of Green Power (4)

The economic feasibility and rationale of producing electricity us ing several alternative environmentally friendly technologies. The economic and environmental costs and benefits of employing these technologies are identified and compared to the dominant technologies (coal, oil, hydropower). Alternative policies that provide incentives for the adoption of green technologies are examined.

Also offered for undergraduate-level credit as Ec 444 and may be taken only once for credit. .

## Ec 545-Comparative Economic Systems (4)

Introduces theevolutionary-institutional method of analys is, incorporating his tory, the legacy of ideas, and the dynamics of change over time. Using this method, we shall examine economic systems of Ancient Rome, Medieval Feudalism, the Laissez-Faire Market Economy, Fascist Command Economy, and others.
Also offered for undergraduate-level credit as Ec 445 and may be taken only once for credit. .

## Ec 546 - Institutional Economics (4)

Considers the contributions of seminal thinkers to what is regarded as an alternate or heterodoxschool in economic science. Contribution of Thornstein Veblen, John R. Commons, Wesley Mitchell, Simon Kuznets, Clarence Ayres, Gunnar Myrdal, and John Kenneth Galbraith, as well as more contemporary thinkers will be explored. Institutional theory will be compared and contrasted with neoclassical economics, and shown as a viable theory posing a formidable challenge to the dominant paradigmof orthodoxy. Neo-institutionalistchallenges will also be considered.
Also offered for undergraduate-level credit as Ec 446 and may be taken only once for credit.

## Ec 547 - Economics of Transition (4)

Examines the formation of the Soviet-type economic systemin the 1920s and 30s and its dis semination after W orld War II to Eastern Europe, China, and other selected countries. Emphasis is placed on the history of ideas and the his torical setting which gave rise to the Soviet model. Includes the examination of the internal contradictions of the model, the "unwinding" of planned socialism, and the prospects for the move toward mixed market economies.
Also offered for undergraduate-level credit as Ec 447 and may be taken only once for credit. .

## Ec 548 - East Asian Economic Development (4)

Key topics in the development of East Asian economies, especially, Japan, China, South Korea, and several Southeast Asian countries. Economic theory will be applied to investigate the validity of the "Asian economic growth model," while examining political, social and historical factors of the area and comparing the experience of theseeconomies with that of other developing countries.
Also offered for undergraduate-level credit as Ec 448 and may be taken only once for credit.
Ec 550 - Economics of Development (4)
Examines problems of post-colonial legacy: underdevelopment and persistent poverty. Rapid population growth, uneven development, capital flight, dual economy, brain drain. Industrialization strategies,
foreign trade, education and human capital, population slowdown, microcredit institutions, role of women.

Also offered for undergraduate-levelcredit as Ec 450 and may be taken only once for credit. .

## Ec 553 - Theory of Economic Growth (4)

Introduction to the theory of economic growth. This course will emphasize the theoretical basis and the models developed to measure growth and change in modern industrial societies.

Also offered for undergraduate-levelcredit as Ec 453 and may be taken only once for credit. .

## Ec 556 - American Economic History: the First Century (4)

The economic background of the W ar of Independence and the seeds of the Civil War. Industrialization, urbanization, and development of the frontier. Rise of big business and org anized labor. Laissez-faire, federalism, and the gradual emergence of the national government in economic policy. Changes in foreign trade and in the international position of the U.S.

Also offered for undergraduate-levelcredit as Ec 456 and may be taken only once for credit. .

Ec 557 - American Economic History: the 20th Century (4)

Economic impact of U.S. involvement in W orld W ar I. Postwar structural changes. Waning of laissez-faire. Causes of the Great Depression. Economic policies of Hoover and Roosevelt administrations. The New Deal reforms. World W ar II and emergence of the administered system. Evolution of the mixed economy and growing role of the government. The industrial military complex. Social imbalance.

Also offered for undergraduate-levelcredit as Ec 457 and may be taken only once for credit. .

## Ec 560 - History of Economic Thought (4)

Selections from the economic writings of various thinkers from antiquity through the Reformation. A survey of the work of the most important economic theoris ts of the 18th, 19th, and 20th centuries including AdamSmith, Ricardo, Marx, Marshall, Veblen, and Keynes. Readings include original writings and interpretations by later economists. Scholars will be studied in terms of their his torical context and the contemporary relevance of the theories and policy recommendations.

Also offered for undergraduate-level credit as Ec 460 and may be taken only once for credit. .

## Ec 565 - Labor Economics (4)

This course investigates the determinants of wages, the decision to work, the reasons demographic groups fare
differently in the labor market, and sources of unemployment. Als oconsiders current developments in labor markets of increasing wage inequality, globalization, declining unionization, and widespread useof new technologies.

Also offered for undergraduate-level credit as Ec 465 and may be taken only once for credit.

## Ec 569 - Introduction to Econometrics (4)

General survey of empirical techniques useful for economic analysis. Focus on the applications of mathematical tools and regression analysis in economics. Quantitative topics will be introduced systematically with hands-on case studies and examples related to the fields of economics, public policy, and urban studies. This course will not be counted as credit for economics graduate students, butmay be taken by graduate students in other programs.
Also offered for undergraduate-level credit as Ec 469 and may be taken only once for credit. .

## Ec 570 - Econometrics (4)

Covers the theory and application of statistical regression, hypothesis testing, and simulation of econometric models. Emphases are placed on model construction and efficient use of economic data. Problems of multicolinearity, heteroscedasticity, autocorrelation, and distributed lags are discussed. Some familiarity with calculus, matrix algebra, and computer applications are assumed.

Prerequisite: Ec 469 or consent of instructor.

## Ec 571 - Advanced Econometrics (4)

Advanced econometrics topics including systems of linear equations, panel data, nonlinear models, nonparametric estimation and prediction, and applications in consumption and production models. Data resources available to the practicing economist will be covered.

## Ec 572 - Time Series Analysis and Forecasts (4)

Time series analysis, emphasizing model identification, estimation, and forecasting. Non-stationary time series analys is includes unit root and cointegration tests. Techniques of moving average, differencing, and autocorrelation adjustment are introduced. Diagnostic checking following the model evaluation provides the base model for forecasting.

Also offered for undergraduate-level credit as Ec 472 and may be taken only once for credit. . Prerequisite: Ec 570 OR permis sion of ins tructor.

## Ec 575 - Applied Advanced Econometrics (4)

Covers advanced topics related to methodological is sues in econometrics, with emphases on computation, simulation,
and non-linear methods in econometrics. Nonlinear econometric models including Box-Cox variable transformation, autoregressive time series analysis, and qualitative choice models. Simulation-based econometrics covers topics of Monte Carlo experiments and bootstrapping methods.

Prerequisite: Ec 570, Ec 571 or consent of instructor.

## Ec 576 - Implementing Econometrics using Stata and R

 (4)Nuts and bolts techniques for implementing econometric analys is using Stata software, the R statistical package and a short introduction to SAS. Topics include organizing data, nonparametric smoothing, graphing techniques, regression diagnostics, Stata and Mata programming. Preparation: an econometrics course or statistics courses including regression analysis.
Also offered for undergraduate-levelcredit as Ec 476 and may be taken only once for credit. Prerequisite: Ec 469 or Ec 570 or permission of the instructor.
Ec 580 - Mathematical Economics (4)
Mathematics for Economists. Application of differential calculus and matrix algebra to economics. Topics include consumer theory, production functions, and applied general equilibriummodels.

Also offered for undergraduate-level credit as Ec 480 and may be taken only once for credit.

## Ec 581 - Advanced Microeconomics (4)

Theory of consumer behavior and of the firm. Market and multimarket equilibrium and stability. Varieties of imperfect competition.
Prerequisite: Ec 480/580 or consent of ins tructor.

## Ec 584 -Applications of Advanced Microeconomic Theory (4)

Applies theories of consumer and producer behavior to a variety of real world problems. Different sub-disciplines of microeconomics will be covered, which may includetwo or three of the following: information economics, environmentaleconomics, economics of regulation, industrial org anization, law and economics, natural resourceeconomics, labor economics, regional economics, urban economics, and the economics of contracting. For each sub-discipline covered, the most important economic model will be discussed and a review of major research studies and techniques will be undertaken.

Prerequisite: Ec 581 or consent of instructor.

## Ec 590 - Advanced Macroeconomics (4)

Theories of national income, employment and price levels with special emphasis on recentdevelopments in analytical techniques and empirical finding.

Prerequisite: Ec 480/580 or consent of instructor and Ec 581 or consent of instructor.

## Ec 592 - Applications of Advanced Macroeconomic Theory (4)

Coverage includes current topics of interest in macroeconomics. The focus is on the applications of neoclassical and Keynesian theories of macroeconomic theory to a variety of real world problems. The various sub-disciplines of macroeconomics that may be covered include: Financial Economics, Monetary Economics, Economic Growth Models, Labor Economics, Public Finance, International Economics, and Radical Macroeconomic Thought.
Prerequisite: Ec 590 or consent of instructor.

## Ec 596 - Res earch Project I (4)

Intended for graduate students to complete the field project requirement. Course activities include: independent reading on researchable field-related topics; individual development of a research project, i.e., selection of a subject and plan of study; and periodic reporting of individual research projects progress. This is the first course in a sequence of two: Ec 596 and Ec 597. Recommended: Ec 595.

## Ec 597 - Research Project II (4)

Intended for graduate students to complete the field project requirement. Course activities include: independent reading on researchable field-related topics; individual development of a research project, i.e., selection of a subject and plan of study; and periodic reporting of individual research projects progress. This is the second course in a sequence of two: Ec 596 and Ec 597. Recommended: Ec 595.

## Ec 603 -Dissertation (1-12)

(Credit to be arranged.)

## Ec 675 - Advanced Macroeconomics II (4)

Extended analysis of macroeconomic theory covering static, deterministic models through recent dynamic and stochastic macro modeling. Analytic tools in both theoretic and empirical models are illustrated in the study of inflation, unemployment, growth and government policy. Recommended: Ec 575.

## Ec 676 - Advanced Microeconomics II (4)

Extended analysis of microeconomic theory covering individual and social choice issues. Selected topics of
interest and significance include but are not limited to: rational choice behavior of consumers and producers, theory of the market, partial and general equilibrium analysis, welfare economics, and economics of inflation. Recommended: Ec 576.

## Ec 698 - Ecos ystem Services Valuation: An Integrated Assessment (4)

Explore environmental, social and economic theories of valuation, quantitative and qualitative methods for incorporating the values into ecosystemservice management decisions, novel approaches for integrating each type of values into comprehensive measures, and applications through interdisciplinary teamprojects. This is the s ame course as Mgmt 698; may only be taken once for credit.
Prerequisite: ESR 692, Soc 694 and Geog 694 or instructor's permis sion. Cross-Listed as:Mgmt 698.

## ECE - Elect and Computer Engineering

## ECE 101 - Exploring Electrical Engineering (4)

Freshman introductory course for students interested in electrical engineering. Students learn the design process, problem-solving, teamwork and presentation skills through completion of a hands-on project. Lab activities familiarize students with basic equipment and components. Speakers present an overview of different fields and career opportunities in electrical engineering. Weekly lab.
Prerequisite: Mth 112 with a grade of C or better or passing at the necessary levelon the mathematics placement test (seePSU Math Department webpage at pdx.edu/math for information). Corequisite: ECE 101L.
ECE 101L-Lab for ECE 101 (0)
Lab for ECE 101.
Corequisite: ECE 101.

## ECE 102 - Engineering Computation (4)

Applying the principles of engineering analysis. Presenting technical content. Utilizing engineering software and writing scripts. Controlling external hardware via programming. Weekly lab.
Prerequisite: ECE 101 or equivalent with a grade of Cor better. Mth 112 with a grade of Cor better or passing at the necessary levelon the mathematics placement test (see PSU Math Department webpage at pdx.edu/math for information). Corequisite: ECE 102L.
ECE 102L-Lab for ECE 102 (0)
Lab for ECE 102.
Corequisite: ECE 102.

## ECE 103 - Engineering Programming (4)

Introduction to software design, algorithms, data structures, and programming using the " C " language. Interfacing to sensors, actuators, and other hardware. Writing documentation and presenting technical content. Weekly lab. Expected preparation: ECE 102.

Prerequisite: MTH 112 with a grade of C or better, or passing at the necessary level on the mathematics placement test (seePSU Math Department webpage at pdx.edu/math for information). Corequisite: ECE 103L.

ECE 103L-Lab for ECE 103 (0)
Lab for ECE 103.
Corequisite: ECE 103.

## ECE 171 -Digital Circuits (4)

Foundation course in digital design. Topics such as number systems, basic logic gates, TTLdevice parameters, Boolean algebra, logic circuit simplification techniques, timing analys is, the application of MSI combinational logic devices, programmable logic devices, flip-flops, synchronous state machines and counters. Introduces students to a systematic design methodology. Uses computer based tools such as schematic capture programs, programmable logic development programs, and digital circuit stimulators.

Prerequisite: Mth 112 with a grade of C or better, or passing at the necessary levelon the mathematics placement test (seeMath Department webpage at pdx.edu/math for information). .

## ECE 172 -Digital Systems (4)

Second course in the digital and microprocessor sequence. Covers shift registers, synchronous state machines, programmable logic devices, memories, and simple arithmetic circuits; introduction to timing analysis, design for test techniques; weekly laboratory.
Prerequisite: ECE 171. Corequisite: ECE 172L.
ECE 172L-Lab for ECE 172 (0)
Lab for ECE 172.
Corequisite: ECE 172.

## ECE 199 -Special Studies (0-4)

(Credit to be arranged.) Consent of instructor.

## ECE 211 - Introduction to Design Processes (1)

Introduction to design for electrical and computer engineers. Preparation for a team project in ECE 212. Discus sion of design processes, needs, requirements, functional decomposition, tes ting and project management. This is the first course in a sequence of two: ECE 211 and

ECE 212 and must be taken in sequence. Co-requisite: ECE 221.

Prerequisite: ECE 103 and ECE 172 (with a grade of C or better). Corequisite: ECE 221.
ECE 212 - Introduction to Project Development (2)
Continuation of ECE 211. Teams of students work on design projects that integrateelectrical and computer engineering skills, knowledge and concepts gained up to this point. Application of structured design methodology to an authentic engineering problem. This is the second course in a sequenceof two: ECE 211 and ECE 212 and must be taken in sequence.
Prerequisite: ECE 211 (with a grade of C or better).

## ECE 221 - Electric Circuit Analysis I (4)

Introduction to the basic methods of circuit analysis including Kirchhoff's laws, res istive circuits, techniques of circuit analys is, operational amplifiers, and energy storage elements. Weekly lab.

Prerequisite: ECE 102 (with a grade of C or better) and Mth 252. Corequisite: ECE 221L.
ECE 221L - Electric Circuit Analysis ILab (0)
Lab for Electric Circuit Analysis I.
Corequisite: ECE 221.

## ECE 222 - Electric Circuit Analysis II (4)

Introduction to the dynamic res ponse of circuits, sinusoidal steady state analysis and the Laplace Transformfor circuit analys is. Includes transient res ponse and phasor and Laplace analys is. Weekly lab.
Prerequisite: ECE 221 (with a grade of C or better). Corequisite: ECE 222L.
ECE 222L - Electric Circuit Analysis II Lab (0)
Lab for Electric Circuit Analysis II.
Corequisite: ECE 222.

## ECE 223 - Electric Circuit Analysis III (4)

Frequency response and ac power. Includes transfer functions, design of analog filters, Bode plot analysis, pole-zero diagrams, and ac and three-phase power. Weekly Lab.
Prerequisite: ECE 222 (with a grade of C or better). Corequisite: ECE 223L.
ECE 223L - Electric Circuit Analysis III Lab (0)
Lab for Electric Circuit Analysis III.
Corequisite: ECE 223.

## ECE 241 - Introduction to Electrical Engineering (4)

DC circuit theory, passive electrical components, transient and sinu soidal steady state circuit responses, ac and threephase power, op-amp circuits, and transformers; laboratory.
Prerequisite: Mth 252. Corequisite: ECE 241L.
ECE 241L - Introduction to Electrical Engineering Lab (0)

Lab for ECE 241 Introduction to Electrical Engineering.
Corequisite: ECE 241.

## ECE 299 -Special Studies (0-4)

(Credit to be arranged.) Consent of instructor.

## ECE 315 -Signals and Systems I(4)

Fundamentals of signals and systems including fundamental signals, basic system properties, linear time invariant systems, Fourier series, Fourier transforms, and filters. This is the first course in a sequence of two: ECE 315 and ECE 316 and must be taken in sequence.

Prerequisite: ECE 223 (with a grade of C or better), Mth 256, Mth 253.

## ECE 316 -Signals and Systems II (4)

Introduction to fundamentals of communications and discrete-time systemanalysis including sampling, modulation, multiplexing, and the z-transform. This is the second course in a sequence of two: ECE 315 and ECE 316 and must be taken in sequence.

Prerequisite: ECE 315 (with a grade of C or better).

## ECE 317 -Feedback and Control Systems (4)

Control of continuous single-input/single-output linear systems using classical feedback techniques. Time and frequency domain analysis. Design in the s-plane and frequency domain. Use of time and frequency system identification techniques for developing plant models. Design of feedback compensators for steady-state error reduction, disturbance rejection, transientstability, and dynamic res ponse.
Prerequisite: ECE 223 and Mth 256(with a grade of C or better).

## ECE 321 -Electronics I (4)

Introduction to solid state electronics, leading to the physical properties and characteristics of solid state electronic devices: diodes, bipolar junction transis tors and field effect transistors. Analysis and design of rectifier topologies and biasing circuits. Application of a computeraided design (CAD) tool, such as SPICE. W eekly Lab.

Prerequisite: ECE 222 (with a grade of C or better). Corequisite: ECE 321L.

## ECE 321L-Electronics ILab (0)

Lab for Electronics I.
Corequisite: ECE 321.

## ECE 322 - Electronics II (4)

Ideal and non-idealOPAMP circuits; Analysis of electronic amplifiers using small-signal models of electronic devices; Differential and operational amplifier design techniques involving current mirrors and active loads; Frequency response of analog circuits; Computeraided design. Weekly Lab.
Prerequisite: ECE 223 and ECE 321 (with a grade of C or better). Corequisite: ECE 322L.

## ECE 322L - Electronics II Lab (0)

Lab for Electronics II.
Corequisite: ECE 322.

## ECE 323 -Electronics III (4)

Feedback topologies. Design and analysis of sinusoidal waveformgenerators. Introduction to phase-locked loops. Study of digital circuits used in various logic families. Computer-aided design. Weekly Lab.

Prerequisite: ECE 322 (with a grade of C or better). Corequisite: ECE 323L.
ECE 323L - Electronics III Lab (0)
Lab for Electronics III.
Corequisite: ECE 323.

## ECE 331 - Engineering Electromagnetics I(4)

Concept of a traveling wave with application to trans mis sion lines; review of vector algebra and calculus in various coordinate systems; Maxwell's equations for magnetostatics and electrostatics; weekly lab.
Prerequisite: Mth 254, Mth 256, Ph 223 or $\operatorname{Ph} 213$. Corequisite: ECE 331L.

ECE 331L - Engineering Electromagnetics ILab (0)
Lab for Engineering Electromagnetics I.
Corequisite: ECE 331.

## ECE 332 - Engineering Electromagnetics II (4)

Maxwell's equations fortime-varying fields; plane wave propagation and reflection; waveguide structures; radiation and antennas. Topics in wave propagation include scattering, optics, principles of radar, signal integ rity and mathematical solution techniques; weekly lab.

Prerequisite: ECE 331 (with a grade of C or better).
Corequisite: ECE 332L.
ECE 332L-Lab for ECE 332 (0)
Lab for ECE 332 Engineering Electromagnetics II.
Corequisite: ECE 332.

## ECE 341 - Introduction to Computer Hardware (4)

An overview of computer architecture and programming from a hardware viewpoint. Topics covered include: digital logic; arithmetic operations; pipelining; CISC/RISC; memory hierarchy; virtual memory; input/output techniques; computer systemcomponents. This course may not be used towards degree requirements for an electrical engineering or a computer eng ineering baccalaureate degree.

Prerequisite: CS 201.

## ECE 351 - Verilog and FPGA Design (4)

Introduces the students to the Verilog Hardware Description Language and describes its role in the electronic design automation environment. Students learn how to prototype digital designs using FPGAs.
Prerequisite: ECE 172 (with a grade ofC or better).
ECE 361 - Computer System Organization (4)
Basic concepts of modern computer systems, computer programming, and datastructures. Topics include s ystem organization, programming and debugging tools, project and software management tools, $\mathrm{C}, \mathrm{C}++$, scripting languages, performance benchmarking, datastructures, lists.

Prerequisite: ECE 102 and ECE 103 (with a grade of C or better) or CS 161 and CS 162 or equivalents.

## ECE 362 - Embedded Operating Systems (4)

Introduction to the principles of modern operating system design. Topics include: introduction to basic operating systemconcepts, processes, inter-process communication and concurrent programming, scheduling, memory management, file systems, device management, introductions to protection security, RTOS structure and operation. Linuxwill be used for class examples and lab assignments.

Prerequisite: ECE 361 (with a grade of C or better).

## ECE 371 -Microprocessors (4)

Microprocessor instruction set architecture of a 32-bit microprocessor, structured development of as sembly language programs, interfacing assembly language and high-level language programs, interrupt procedures, handshake data transfer, and interfacing with simple digital devices. Introductions to microcomputer memory systems, virtual memory, and overview of microprocessor
evolution. Course includes two software/hardware development projects.

Prerequisite: ECE 103 (with a grade of C or better) or CS 162, ECE 172 (with a grade of C or better).

## ECE 372 - Microprocessor Interfacing andEmbedded

 Systems (5)Teaches thehard ware and software design of embedded microproces sor systems. Topics include sensor, transducer, and actuator interfacing; microprocessor-based process control; interfacing with dis play, vision, and speech systems;Real Time Operating System(RTOS) operation; creation of device drivers; intelligent robotics applications; and an introduction to the Unified Modeling Language (UML); weekly laboratory.

Prerequisite: ECE 371 (with a grade of C or better). Corequisite: ECE 372L.
ECE 372L-Lab for ECE 372 (0)
Lab for ECE 372 Microprocessor Interfacing and Embedded Systems.
Corequisite: ECE 372.
ECE 373 - Embedded Operating Systems \& Device Drivers (5)
Extends the microprocessor interfacing skills gained in ECE 372 to the design of hardware and device drivers for a microproces sor systemwith an embedded operating system. After a brief introduction to the basic structure and operations of the Linux OS, students will gain extensive practice developing Linuxdevice drivers for a wide variety of hardware devices. Course will also include discussions of security and power management techniques commonly used in embedded microprocessors systems.
Prerequisite: ECE 372 (with a grade of C or better) or corequisite CS 333. Corequisite: ECE 373L.
ECE 373L - LAB FOR ECE 373 (0)
Lab for ECE 373.
Corequisite: ECE 373.

## ECE 383U- Nanotechnology: Simulation \& Design (4)

Introductory circuit simulation; properties of selected nanotechnology devices and systems; nanodevice simulation; development of nanodevice models. May be taken to satisfy the ECE technical writing requirement. This is the same course as SCI 383 and may be taken only once forcredit.
Prerequisite: junior standing or permis sion of the instructor. Cross-Listed as: Sci 383U.

ECE 399 -Special Studies (0-8)
(Credit to be arranged.)

## ECE 401 - Research (1-6)

(Credit to be arranged.) Consent of instructor.

## ECE 402 - Independent Study (1-12)

(Credit to be arranged.)

ECE 403 -Honors Thesis (1-4)
(Credit to be arranged.) Consent of instructor.

## ECE 404 - Cooperative Education/Internship (1-12)

(Credit to be arranged.) Consent of instructor.

## ECE 405 - Reading and Conference (1-6)

(Credit to be arranged.) Consent of instructor.

## ECE 406 -Special Projects (1-6)

(Credit to be arranged.) Consent of instructor.

## ECE 407 -Seminar (1-6)

(Credit to be arranged.) Consent of instructor.

## ECE 409 - Practicum(1-8)

(Credit to be arranged.) Consent of instructor.

## ECE 410 -SelectedTopics (0-6)

(Credit to be arranged.) Consent of instructor.

ECE 411 - Industry Design Processes (2)
Prepares students for ECE 412 and ECE 413 Senior Project Development I and II. Topics include: design documentation standards; building and managing effective teams; product development steps; developing and presenting project proposals; design processes; project scheduling and management; design to meet desired needs. Lectures and a team-based term project.
Prerequisite: EE students need ECE 315 and ECE 316 and ECE 321 and ECE 322 and ECE 331 and ECE 371 and EE 347 or CmpE students needECE 315 and ECE 321 and ECE 361 and ECE 362 and ECE 371 and ECE 372. All courses must be passed with a grade of C or better.

## ECE 412 -Senior Project Development I (4)

Project teams apply structured design methodology from ECE 411 to original projects with as sistance of faculty and industrial/community advisers and after initial research, prepare written and oral project proposals. Students keep logs of their design work and submit weekly progress reports. Groups periodically give oral progress reports.
Prerequisite: ECE 411 (with a grade of C or better).

## ECE 413 -Senior Project Development II (2)

Concludes development of design projects started in ECE 412. Students maintain logs of their individual work and submit weekly progress reports. Each group prepares final written and oral reports for the project sponsor. Each group creates a poster and participates in the poster session at the end of the quarter.
Prerequisite: ECE 412.

## ECE 414 -Microsystem Integration and Packaging (4)

Introduction to integrated circuit packaging and microelectronics systemintegration; signal integrity; electrical, mechanical, and thermal aspects of micros ystem package simulation and design; electronics packaging materials; micros ys temreliability and failure mechanisms; current technology developments.

Prerequisite: senior or graduate standing in ECE. CrossListed as: Also offered for graduate-levelcredit as ECE 514 and may be taken only once for credit. .
ECE 415 - Fundamentals of Semiconductor Devices (4)
Solid-state electronic devices; operation, fabrication and applications; single crystal growth, p-n junction, diodes, bipolar junction transistors, MOS capacitor, FETs. Course provides students with a sound understanding of existing devices and gives the necessary background to understand the problems and challenges of the micro-electronic manufacturing.
Also offered for graduate-level credit as ECE 515 and may be taken only onceforcredit. .Prerequisite: Ph 319, ECE 322 (with a grade of C or better).

## ECE 416 - Integrated Circuit (IC) Technologies (4)

Microelectronic processing of solid-state devices and integrated circuits. A base for understanding more advanced processing and what can and cannot be achieved through IC fabrication. Oxidation, diffusion, and ion implantation will be discussed. Bipolar, CMOS and BiCMOS fabrication processes. DRAM technology. Defining systemrules for IC layout. Packaging and yield. New technologies, such as Wafer-Scale Integration and Multi-Chip Modules, will be discussed. Students will be introduced to the concept of designing for manufacturability.

Also offered for graduate-level credit as ECE 516 and may be taken only once for credit. . Prerequisite: ECE 415 (with a grade of C orbetter).

## ECE 417 -Nanoelectronics (4)

Operational principles and circuit applications of nanoelectronic devices: electron tunneling devices, (Es aki and resonant tunnel diodes, single electron transistors, nanodot arrays) carbon nanotubes, nanowires, molecular electronics, and spintronics; nano-fabrication techniques.
Also offered for graduate-level credit as ECE 517 and may be taken only once for credit. . Prerequisite: ECE 322 (with a grade of C orbetter) and Ph 319.

## ECE 421 - Analog Integrated Circuit Design I (4)

Modeling of IC devices: transis tors, capacitors, resistors. Temperature and device parameter variation effects. Building blocks of analog integrated circuits: current sources and mirrors, gain stages, level shifters, and output stages. Design of supply and temperature independent bias ing schemes. CAD tools for circuit design and testing.

Also offered for graduate-level credit as ECE 521 and may be taken only once for credit. . Prerequisite: ECE 323 (with a grade of C orbetter).

## ECE 422 - Analog Integrated Circuit Design II (4)

Analysis and design of BJT and MOS operational amplifiers, current-feedback amplifiers, wideband amplifiers and comparators. Frequency response of amplifiers. Feedback techniques, analy sis and design. Stability and compensation of amplifiers, high slew-rate topologies. Noise in IC circuits. Fully differential circuits, analog multipliers and modulators. CAD tools for circuit design and testing.
Also offered for graduate-level credit as ECE 522 and may be taken only once for credit. .Prerequisite: ECE 421 (with a grade of C orbetter).

## ECE 424 -Engineering Professional Practice (2)

Prepares graduates for careers in electrical and computer engineering. Topics includeethical reasoning and cons iderations, strategies for job acquisition, career planning, certification and licensure, approaches to lifelong learning, and means of maintaining awareness of contemporary global and local societal issues.
Prerequisite: ECE 411 (with a grade ofC or better).

## ECE 425 - Digital Integrated Circuit Design I(4)

Students in electrical and computer engineering are introduced to the analysis and design of digital integrated circuits. A design project is an integral part of this course.
Also offered for graduate-level credit as ECE 525 and may be taken only once for credit. .Prerequisite: ECE 321 (with a grade of C or better), Stat 351 .

## ECE 426 - Digital Integrated Circuit Design II (4)

Students are instructed in methods and the use of computer-aided design tools forthe design and testing of large-scale integrated digital circuits. A design project is an integral part of this course.
Also offered for graduate-level credit as ECE 526 and may be taken only once forcredit. .Prerequisite: ECE 425 (with a grade of C or better).

## ECE 428 - VLSI Computer-Aided Design (4)

Introduces basic techniques and algorithms for computeraided design and optimization of VLSI circuits. The first part discusses VLSI design process flow for custom, ASIC and FPGA design styles and gives an overview of VLSI fabrication with emphasis on interconnections. The neces sary background in graph theory and mathematical optimization is introduced. In the second part, application of different analytical and heuristic techniques to physical design (partitioning, placement, floor planning and routing) of VLSI circuits is studied. We shallemphasize VLSI design is sues encountered in deep submicron technology. Throughout the course students will be exposed to research methodology and to a setof academic and commercial CAD tools for physical design.
Also offered for graduate-level credit as ECE 528 and may be taken only once forcredit. .Prerequisite: senior or graduate standing.

## ECE 431 - Microwave CircuitDesign I(4)

Passive microwave components. Design of microstrip circuits. Activehigh frequency devices. Microwave computer aided design.
Also offered for graduate-level credit as ECE 531 and may be taken only once forcredit. .Prerequisite: ECE 332 (with a grade of C or better). Corequisite: ECE 431L.

## ECE 431L-Microwave Circuit Design ILab (0)

Lab for Engineering Electromagnetics I.
Corequisite: ECE 431.

## ECE 432 - Microwave CircuitDesign II (4)

Small-signal amplifier design for gain and noise. Nonlinear effects and nonlinear circuit design. Os cillator design. Introduction to MMIC design. Design project is an integral part of this course.
Also offered for graduate-level credit as ECE 532 and may be taken only once forcredit. .Prerequisite: ECE 431 (with a grade of C or better). Corequisite: ECE 432L.

## ECE 432L-Microwave Circuit Design II Lab (0)

Lab for Microwave Circuit Design II.
Corequisite: ECE 432.

## ECE 435 -Radar and Sonar Processing (4)

Introduction to radar and sonar processing including detection and estimation theory, array processing, and signal propagation models. Course will concentrate on physics-based processing techniques applied to real systems with application to remote sensing, underwater sonar and medicalimaging. Pulsed systems and spectroscopy may also be covered in the context of terahertzsensing. Coursework will involve readings from current scientific journals and MATLAB data processing.

Also offered for graduate-level credit as ECE 535 and may be taken only once for credit. . Prerequisite: ECE 331 and ECE 332 (with a grade of C or better).

## ECE 445 -Power Hectronic Systems Design I(4)

Basic DC-to-DC switching con verter topologies are presented. Operation in various modes is examined. Steady state design is undertakenusing state space techniques and equivalentcircuit modeling. Design issues concerning semiconductor devices and magnetics design are also addressed.
Also offered for graduate-level credit as ECE 545 and may be taken only once for credit. .Prerequisite: ECE 322 (with a grade of C orbetter).

## ECE 446 -Power Electronic Systems Design II (4)

Dynamic analys is of DC-to-DCconverters is presented using state space techniques and the method of equivalent circuit modeling of the switching device. Different control techniques such as current programming and sliding mode control are introduced. Inverter and input current wave shaping rectifier circuits are als o introduced.
Also offered for graduate-level credit as ECE 546 and may be taken only once for credit. .Prerequisite: ECE 445 (with a grade of C orbetter).

## ECE 451 - Control Systems Design I(4)

State space description of linear systems. Con trollability and observability. Controller and observer designby pole placement. Optimal control, linear quadratic regulator, linear quadratic estimator (Kalman filter), linear quadratic Gaussian with loop transfer recovery design procedures.

Also offered forgraduate-level credit as ECE 551 and may be taken only once for credit. . Prerequisite: ECE 317 (with a grade of C orbetter), Mth 261 orMth 343.

## ECE 452 -Control Systems Design II (4)

Dis crete-time control systems, ztransforms, difference equations, pulse transfer function, sampling, data hold, block diagramreduction. Jury stability test. Various approaches to classical control design of dis crete time controllers. State space analysis and design in dis cretetime.

Also offered for graduate-level credit as ECE 552 and may be taken only once for credit. .Prerequisite: ECE 451 (with a grade of C or better).

## ECE 457 - Engineering Data Analysis and Modeling (4)

Introduces statisticallearning theory and practical methods of extracting information fromdata. Covers time-proven methods of statistical hy pothesis testing, linear modeling, univariate s moothing, density estimation, nonlinear modeling, and multivariate optimization.
Also offered for graduate-level credit as ECE 557 and may be taken only once for credit. . Prerequisite: Mth 343 and Stat 351.

## ECE 461 - Communication Systems Design I(4)

An introduction to signals and noise in electrical communication systems; signal spectra and filters, noise and randomsignals, base band transmission of an alog and digital signals, linear modulation and exponential modulation.
Also offered for graduate-level credit as ECE 561 and may be taken only once forcredit. .Prerequisite: ECE 223 (with a grade of C or better).

## ECE 462 - Communication Systems Design II (4)

Study of the relative merits of communication systems, noise in continuous wave and pulse modulation schemes, information theory, digital datas ystems, and advanced topics.
Also offered for graduate-level credit as ECE 562 and may be taken only once forcredit. .Prerequisite: ECE461 (with a grade of C or better).

## ECE 478 - Intelligent Robotics I (4)

Basic problems of intelligent robotics. Hardware for Artificial Intelligence and Robotics. Formulation and reduction of problems. Tree search. Predicate calculus and resolution method. Methods of formulating and solving problems in logic programming. Fuzzy Logic. Logic programming and artificial intelligence in robot systems. Reasoning by analogy and induction. Associative processors.
Also offered for graduate-level credit as ECE 578 and may be taken only once for credit. .Prerequisite: ECE 372 (with a grade of C or better).

## ECE 479 - Intelligent Robotics II (4)

Sens ors. Computer vision hardware. Problems in image processing, vision, manipulation, and planning. Machines for image proces sing and computer vision. Morphological processors. Manufacturing inspection. Non-numeric computers. Path planning. Localization. Use of reasoning and learning. Applications in scheduling, planning, and as signment. Computer architectures for robotics. Integrated robotic systems for manufacturing. Architectures of
comprehensive mobile robots. Robots in health care. Systemintegration. Examples of application.

Also offered for graduate-level credit as ECE 579 and may be taken only once for credit. . Prerequisite: ECE 478 (with a grade of C orbetter).

## ECE 481 - ASIC: Modeling and Synthesis (4)

Covers the fundamentals of the ASIC design process. The topics include ASIC designFlow, basic HDLconstructs, test benches, modeling combinational and synchronous logic, modeling finite state machines, multiple clock domain designs, qualitative design is sues, ASIC constructions.
Also offered for graduate-level credit as ECE 581 and may be taken only once for credit. . Prerequisite: ECE 371 (with a grade of C orbetter).

## ECE 483 -Low Power Digital IC Design (4)

Introduction to the existing techniques for IC power modeling, optimization, and synthesis. Topics include: sources of power dis sipation, design for low power, voltage scaling approaches, power analysis techniques, power optimization techniques, low-power system-level designs. Focus on abstraction, modeling, and optimization at all levels of designhierarchy, including the technology, circuit, layout, logic, architectural, and algorithmic levels.
Also offered for graduate-level credit as ECE 583 and may be taken only once for credit. . Prerequisite: ECE 425 (with a grade of C orbetter).

## ECE 485 -Microprocessor SystemDesign (4)

Advanced hardware and software design of desktop type microcomputer systems. Topics includelarge project design management and documentation; DRAM system design, cache org anization, connections, and coherency; the memory hierarchy and virtual memory; I/O buses such as AGP, PCI-X, and Infiniband; multithreaded operating systemconsiderations; JTAG(IEEE1149.1) and Design For Test; high frequency signal integrity; and power supply considerations. Team-based, independent design projects are a substantial part of the homework for this class.
Also offered for graduate-levelcredit as ECE 585 and may be taken only once for credit. . Prerequisite: ECE 372 (with a grade of C orbetter).

## ECE 486 - Computer Architecture (4)

An introduction to the key concepts of computer system architecture and design. Topics include the design and analys is of instruction set architectures, memory systems, and high-performance IO systems; basic CPU implementation strategies; basic pipelined CPU implementation; performance analysis; and a survey of current architectures.

Also offered for graduate-level credit as ECE 586 and may be taken only once for credit. .Prerequisite: ECE 485 (with a grade of C or better).

## ECE 491 - Laser Systems Design I (4)

Laser topics: especially design of laser, fiberoptic, and related optical systems. Formation and propagation of modes and beams, matrix methods for the analysis and synthesis of optical systems.
Also offered for graduate-level credit as ECE 591 and may be taken only once for credit. .Prerequisite: ECE 331 (with a grade of C or better).

## ECE 492 - Laser Systems Design II (4)

Interaction of light with atoms, Maxwell Schrodinger analys is and rateequation approximations. Effects of gain, dis persion, and saturation in the design of laser amplifiers and oscillators. Expected preparation: ECE 331.
Also offered for graduate-level credit as ECE 592 and may be taken only once for credit. .

## ECE 501 - Research (1-12)

(Credit to be arranged.) Consent of instructor.

## ECE 502 - Independent Study (1-12)

(Credit to be arranged.)

## ECE 503 - Thesis (1-12)

(Credit to be arranged.) Consent of instructor.

ECE 504-Cooperative Education/Internship (1-12)
(Credit to be arranged.) Consent of instructor.

## ECE 505 - Reading and Conference (1-6)

(Credit to be arranged.) Consent of instructor.

## ECE 506-Special Projects (1-9)

(Credit to be arranged.) Consent of instructor.

## ECE 507 -Seminar (1-6)

(Credit to be arranged.) Consent of instructor.

## ECE 508 - Workshop(1-9)

(Credit to be arranged.)

## ECE 510 -SelectedTopics (0-6)

(Credit to be arranged.) Consent of instructor.

## ECE 511 -SolidState Electronics I (4)

The solid state electronics course sequence deals with advanced topics in solid state device physics and modeling. Following a discussion on semiconductor properties and modeling as a function of doping and temperature, advanced bipolar transistor structures and MOS transistors will be treated in detail. Device models aimed at numerical circuit simulators will be discussed. This is the first course in a sequence of three: ECE 511, ECE 512, and ECE 513.
Also offered for ECE 611 and may be taken only once for credit. .

## ECE 512 -SolidS tate Electronics II (4)

The solid state electronics course sequence deals with advanced topics in solid state device physics and modeling. Following a dis cussion on semiconductor properties and modeling as a function of doping and temperature, advanced bipolar transistor structures and MOS transistors will be treated in detail. Device models aimed at numerical circuit simulators will be discussed. This is the second course in a sequence of three: ECE 511, ECE 512, and ECE 513.
Also offered for ECE 612 and may be taken only once for credit. .

## ECE 513 -SolidState Eectronics III (4)

The solid state electronics course sequence deals with advanced topics in solid state device physics and modeling. Following a discussion on semiconductor properties and modeling as a function of doping and temperature, advanced bipolar transistor structures and MOS transistors will be treated in detail. Device models aimed at numerical circuit simulators will be discussed. This is the third course in a sequence of three: ECE 511, ECE 512, and ECE 513.

Also offered for ECE 613 and may be taken only once for credit. . Prerequisite: ECE 323.

## ECE 514-Microsystem Integration and Packaging (4)

Introduction to integrated circuit packaging and microelectronics system integration; signal integrity; electrical, mechanical, and thermal aspects of microsystem package simulation and design; electronics packaging materials; micros ystemreliability and failure mechanisms; current technology developments.

Also offered for undergraduate-level credit as ECE 414 and may be taken only once forcredit. . Prerequisite: senior or graduate standing in ECE.

## ECE 515 - Fundamentals of Semiconductor Devices (4)

Solid-state electronic devices; operation, fabrication and applications; single crystal growth, p-n junction, diodes, bipolar junction transistors, MOS capacitor, FETs. Course provides students with a sound understanding of existing devices and gives the necessary background to understand the problems and challenges of the micro-electronic manufacturing.
Also offered for undergraduate-level credit as ECE 415 and may be taken only once for credit. . Prerequisite: Ph 319, ECE 322.

## ECE 516 - Integrated Circuit (IC) Technologies (4)

Microelectronic processing of solid-state devices and integrated circuits. A base for understanding more advanced processing and what can and cannot be achieved through IC fabrication. Oxidation, diffusion, and ion implantation will be discussed. Bipolar, CMOS and BiCMOS fabrication processes. DRAM technology. Defining systemrules for IC layout. Packaging and yield. New technologies, such as W afer-Scale Integration and Multi-Chip Modules, will be discussed. Students will be introduced to the concept of designing for manufacturability.

Also offered for undergraduate-level credit as ECE 416 and may be taken only once for credit. . Prerequisite: ECE 415/515.

## ECE 517 - Nanoelectronics (4)

Operational principles and circuit applications of nanoelectronic devices: electrontunneling devices, (Esaki and resonant tunnel diodes, single electron transistors, nanodotarrays) carbon nanotubes, nanowires, molecular electronics, and spintronics; nano-fabrication techniques.
Also offered for undergraduate-level credit as ECE 417 and may be taken only once for credit. .

## ECE 521 - Analog Integrated Circuit Design I (4)

Modeling of ICdevices: transistors, capacitors, resistors. Temperature and device parameter variation effects. Building blocks of an alog integrated circuits: current sources and mirrors, gain stages, level shifters, and output stages. Design of supply and temperature independent biasing schemes. CAD tools for circuit design and testing.
Also offered for undergraduate-level credit as ECE 421 and may be taken only once for credit. .

## ECE 522 - Analog Integrated Circuit Design II (4)

Analysis and design of BJT and MOS operational amplifiers, current-feedback amplifiers, wideband amplifiers and comparators. Frequency response of amplifiers. Feedback techniques, analysis and design. Stability and compensation of amplifiers, high slew-rate topologies. Noise in IC circuits. Fully differential circuits,
analog multipliers and modulators. CAD tools for circuit design and testing.

Als o offered for undergraduate-level credit as ECE 422 and may be taken only once for credit. . Prerequisite: ECE 421/521.

## ECE 523 - Analog Integrated Circuit Design III (4)

Integrated-circuit oscillators and timers, frequency-tovoltage converters, phase-locked-loop circuits, IC filters, self-tuning filters, digital-to-analog converters, analog-todigital converters, CAD tools for circuit design and testing.

Prerequisite: ECE 422/522.

## ECE 524 - Advanced Embedded In Silicoand In Materio Computing (4)

Introduces and develops the advanced hardware and software concepts, design methodologies, and programming paradigms of emerging embedded in silico and in materio computing systems. Topics covered: physics of computation, spatial computing paradigms, selfas sembly and self-organization, morphogenetic systems, molecular and nano-scale computing, non-classical computing and non-classical programming paradigms, amorphous computing.

Also offered as ECE 624 and may be taken only once for credit. . Prerequisite: ECE 371 or permission of the instructor.

## ECE 525 - Digital Integrated Circuit Design I(4)

Students in electrical and computer engineering are introduced to the analysis and design of digital integrated circuits. A design project is an integral part of this course.
Also offered for undergraduate-level credit as ECE 425 and may be taken only once for credit. .

## ECE 526 -Digital Integrated Circuit Design II (4)

Students are instructed in methods and the use of computer-aided design tools forthe design and testing of large-scale integrated digital circuits. A design project is an integral part of this course.

Also offered for undergraduate-level credit as ECE 426 and may be taken only once for credit. . Prerequisite: ECE 425/525.

## ECE 527 -High-performance Digital Systems (4)

The use of computer-aided design tools in high performance digital systems is explored. The trade-offs between automated and hand design are examined in the context of performance vs. development time. The impact of new developments in MOS circuit technology are also examined.
Also offered as ECE 627 and may be taken only once for credit. . Prerequisite: ECE 426/526.

## ECE 528 - VLSI Computer-Aided Design (4)

Introduces basic techniques and algorithms for computeraided design and optimization of VLSI circuits. The first part discusses VLSI design process flow for custom, ASIC and FPGA design styles and gives an overview of VLSI fabrication with emphasis on interconnections. The neces sary backg round in graph theory and mathematical optimization is introduced. In the second part, application of different analytical and heuristic techniques to physical design (partitioning, placement, floorplanning and routing) of VLSI circuits is studied. We shall emphas ize VLSI design is sues encountered in deep submicrontechnology. Throughout the coursestudents will be exposed to research methodology and to a set of academic and commercial CAD tools for physicaldesign.

Also offered for undergraduate-level credit as ECE 428 and may be taken only once for credit. . Prerequisite: senior or graduate standing.
ECE 529-CAD for ULSI and Emerging Technologies (4)

Course will cover Computer-Aided Design (CAD) challenges for ultra submicron CMOS systemdesign and circuit and systemdesign in new emerging technologies. It will cover (1) system design approaches and optimization techniques in the presence of process andenvironmental parameter variations (2) statistical approaches to circuit and systemdes ign, (3) physical design (layout) role in performance evaluation of digital systems, and (4) design and architecture outlook for beyond CMOS Switches.
Also offered as ECE 629 and may be taken only once for credit. . Prerequisite: ECE 428/528 or consent of instructor.

## ECE 530 - Physical Design of Digital Integrated Circuits (4)

Introduces physical design of low power and high performance digital integrated circuits including SoCs with the goal of delivering layout clean database for fabrication of ICs in foundries. Topics covered include all physical design steps such as floorplanning, placement, clock tree synthesis and routing, low power design with IEEE UPF (Unified Power Format), IP (Intellectual Property) design and integration, variation modeling for maximizing yield, implementation of testing circuits, multi-corner multimode performance, convergence, and manual fixing of design rules. Expected Prep: ECE 581.

## ECE 531 -Microwave CircuitDesign I(4)

Passive microwave components. Design of microstrip circuits. Activehigh frequency devices. Microwave computer aided design.

Also offered for undergraduate-level credit as ECE 431 and may be taken only once for credit. . Corequisite: ECE 531 L .

## ECE 531L-Microwave Circuit Design ILab (0)

Lab for Microwave Circuit Design I.
Corequisite: ECE 531.

## ECE 532 -Microwave CircuitDesign II (4)

Small-signal amplifier design for gain and noise. Nonlinear effects and nonlinear circuit design. Oscillator design. Introduction to MMIC design. Design project is an integral part of this course.

Als o offered for undergraduate-level credit as ECE 432 and may be taken only once for credit. . Prerequisite: ECE 431/531. Corequisite: ECE 532L.

## ECE 532L-Microwave Circuit Design II Lab (0)

Lab for Microwave Circuit Design II.
Corequisite: ECE 532.

## ECE 533 - Advanced Electromagnetics (4)

Advanced course in electromagnetics. Mathematical methods, electrostatics, boundary value problems, magnetostatics, time varying fields, plane waves.
Also offered as ECE 633 and may be taken only once for credit. . Prerequisite: ECE 331.

## ECE 534 -Acoustics (4)

Fundamentals of linear acoustics: acoustic wave equations, scattering theory and acoustic propagation. Numerical techniques. Applications emphasizing underwater acoustics and medical ultrasound.

Also offered as ECE 634 and may be taken only once for credit. . Prerequisite: graduatestanding.

## ECE 535 - Radar and Sonar Processing (4)

Introduction to radar and sonar processing including detection and estimation theory, array processing, and signal propag ation models. Course will concentrate on physics-based processing techniques applied to real systems with application to remote sensing, underwater sonar and medicalimaging. Pulsed systems and spectroscopy may also be covered in the context of terahertzsensing. Coursework will involve readings from current scientific journals and MATLAB data processing.

Also offered for undergraduate-level credit as ECE 435 and may be taken only once forcredit. .

## ECE 538 -Statistical Signal Processing I: Nonparametric Estimation (4)

Unified introduction to the theory, implementation, and applications of statistical signal processing methods. Focus
on estimation theory, randomsignal modeling, characterization of stochastic signals and systems, and nonparametric estimation. Designed to give a solid foundation in the underlying theory balanced with a discussion of the practical advantages and limitations of nonparametric estimation methods. Also offered as ECE 638 and may be taken only once for credit.
Also offered as ECE 638 and may be taken only once for credit. .

## ECE 539 - Statistical Signal Processing II: Linear Estimation (4)

Unified introduction to the theory, implementation, and application of statistical signal processing methods. Focus on optimumlinear filters, least square filters, the Kalman filter, signal modeling, and parametric spectral estimation. Designed to give a solid foundation in the underlying theory balanced with examples of practical applications and limitations. Recommended: ECE 538/638.

Also offered as ECE 639 and may be taken only once for credit. .

## ECE 540 - System-on-ChipDesign with FPGAs (4)

Tools and techniques for designing, verifying and implementing System-on-Chip (SoC) designs using an FPGA development board. Along with class work, students take several projects from concept through synthesis and debug using key techniques for optimizing a design. Expected preparation: ECE 351 Hardware DescriptionLanguages and Prototyping or equivalent.

Prerequisite: Graduate standing. Student must be familiar with Verilog HDL or VHDL. Knowledge of a computer programming language such as Cor Assembly Language is helpfulbut not required.

## ECE 543 - Power Systems Control (4)

State estimation, security and contingency monitoring, automatic generation control, economic dispatch, optimal power flow, power systems tability, unit commitment and pooloperation.
Prerequisite: ECE 448/548, or ins tructor permission.

## ECE 544 - Embedded SystemDesign with FPGAs (4)

Students take several embedded systemprojects from concept through debug on an FPGA development board while learning how to design and implement integrated hardware/software applications that interact with "real world" devices. Xilinx software tools and the GNU tool chain are used. Programming is done in $\mathrm{C} / \mathrm{C}++$.
Prerequisite: ECE 540 or consent of instructor.

## ECE 545 - Power Electronic Systems Design I (4)

Basic DC-to-DC switching converter topologies are presented. Operation in various modes is examined. Steady
state design is undertakenusing state space techniques and equivalent circuit modeling. Design is sues concerning semiconductor devices and magnetics design are also addressed.
Also offered for undergraduate-level credit as ECE 445 and may be taken only once for credit. .

## ECE 546 -Power Electronic Systems Design II (4)

Dynamic analys is ofDC-to-DCconverters is presented using state space techniques and the method of equivalent circuit modeling of the switching device. Different control techniques such as current programming and sliding mode control are introduced. Inverter and input current wave shaping rectifier circuits are also introduced.
Also offered for undergraduate-level credit as ECE 446 and may be taken only once for credit. . Prerequis ite: ECE 445/545.

## ECE 551 - Control Systems Design I(4)

State space description of linear systems. Controllability and observability. Controller and observer design by pole placement. Optimal control, linear quadratic regulator, linear quadratic estimator (Kalman filter), linear quadratic Gaussian with loop transfer recovery design procedures.

Also offered for undergraduate-level credit as ECE 451 and may be taken only once for credit. .

## ECE 552 - Control Systems Design II (4)

Discrete-time control systems, ztransforms, difference equations, pulse transfer function, sampling, data hold, block diagramreduction. Jury stability test. Various approaches to classical control design of dis crete time controllers. State space analysis and design in discretetime.

Als o offered for undergraduate-level credit as ECE 452 and may be taken only once for credit. . Prerequisite: ECE 451/551.

## ECE 553 - Control Systems Design III (4)

Topics in modern feedback control theory of nonlinear and multivariable systems, including considerations of stochastic and optimal control. Design methods of computer workstations.
Prerequisite: ECE 452/552.

## ECE 557 - Engineering Data Analysis and Modeling (4)

Introduces statis tical learning theory and practical methods of extracting information fromdata. Covers time-proven methods of statistical hy pothesis testing, linear modeling, univariate s moothing, density estimation, nonlinear modeling, and multivariate optimization.
Also offered for undergraduate-level credit as ECE 457 and may be taken only once for credit. .

## ECE 558 - Embedded Systems Programming (4)

Equips students with the skills required to programmodem embedded systems. Topics includeobject oriented and event-based programming, multi-tasking, advanced sens ors, databases, location-based services, and networking. Heavily project-oriented, allowing students to acquire hands-on experiences based on the foundational material taught in the lectures.
Prerequisite: ECE 485 or ECE 585. Experience with Object-Oriented programming and Java.

## ECE 559 - Genetic Algorithms (4)

Theory and applications of genetic algorithms. Study of the Schema and No Free Lunch theorems. Techniques for using genetic algorithms to solvemulti-objective and NPhard optimization problems fromphysical science, natural science, en gineering and mathematical fields. Investigation of game theory problems, evolvable hardware problems, and constrained parameter optimization problems. Survey of current technical literature in evolutionary computation.

Prerequisite: CS 163 or equivalent.

## ECE 560 - Assertion Based Verification (4)

Exploration of practical approaches to functional verification of industrial scale RTL designs using as sertions and formal verification tools. Topics include pre-silicon simulation and formal verification, System Verilog Assertions, and systemverification problem solving approaches. Course will emphasize hands on experience writing as sertions and using formal verification techniques. Familiarity with computer architecture and hardware description languages is recommended.
Prerequisite: Graduatestanding in ECE or permis sion of instructor.

## ECE 561 - Communication Systems Design I(4)

An introduction to signals and noise in electrical communication systems; signal spectra and filters, noise and randomsignals, base band transmission of analog and digital signals, linear modulation and exponential modulation.
Also offered for undergraduate-level credit as ECE 461 and may be taken only once for credit. .

## ECE 562 - Communication Systems Design II (4)

Study of the relative merits of communication systems, noise in continuous wave and pulse modulation schemes, information theory, digital datas ystems, and advanced topics.
Also offered for undergraduate-level credit as ECE 462 and may be taken only once for credit. . Prerequisite: ECE 461/561.

## ECE 563-Grad School Essentials: A Crash Course in Scholarly Skills I(1)

The purpose of the course is to make students better scholars. At the completion of the course, students should be familiar with the tasks and activities for successfully completing a M.S. or PhD thesis. Grad School Essentials I focuses on the foundations and on writing a thesis. May be repeated onceforcredit.
Prerequisite: All students must be proficient in written and spoken English before taking this course.

## ECE 564-Grad School Essentials: A Crash Course in Scholarly Skills II (1)

The purpose of the course is to make students better scholars. At the completion of the course, students should be familiar with the tasks and activities for successfully completing a M.S. or PhD thesis. Grad School Es sentials II focuses on writing a paper. May be repeated once for credit.
Prerequisite: ECE 563. All students must be proficient in written and spoken English before taking this course.

## ECE 567 -Statistical Communications Theory (4)

As an advanced course in communication theory, topics of statistical decision, estimation, and modulation theory are introduced. Statistical as pects of transmis sion detection and error detection/correction schemes are covered.
Also offered as ECE 667 and may be taken only once for credit. . Prerequisite: ECE 461/561, 565/665.

## ECE 571 - Introduction to System Verilog for Design and Verification (4)

Introduction to SystemVerilog: language features to support both design and verification. Good practices for simulation and synthesis, techniques for constructing reus able testbenches. Additionaltopics may include hardware acceleration and transaction-based verification techniques. Course includes homework and significant final project with presentation. Familiarity with Verilog (such as that attained in ECE 351, ECE 540, ECE 544 or ECE 508: Verilog Workshop) is assumed.

## ECE 572 - Advanced Logic Synthesis (4)

Boolean and multivalued algebras. Cube calculus and its computer realization. Basic operators and algorithms of function minimization. Decomposition and factorization theories. Multilevel minimization. Orthogonal expansions and tree circuits. Cellular logic and its applications to Field Programmable Gate Arrays. Spectral theory of logic optimization. Ordered Binary and Multiple-Valued Decis ion Diagrams. Designfors peed, testability, power consumption, reliability, Reed-Mullerforms, and EXOR circuits. Technology mapping. Modern logic synthesis
programs, systems, and methodologies. Project that continues in ECE 573.

Also offered as ECE 672 and may be taken only once for credit. .

## ECE 573 - Control Unit Design (4)

Synchronous logic, Finite State Machines: and Moore and Mealy models. Design of FSMs fromregular expressions, nondeterministic automata, Petri Nets and parallel program schemata. Partitioned control units. Cellular automata. Realization, minimization, assignment and decomposition of FSMs. Partition and decomposition theory and programs. Micro-programmed units. Microprogram optimization. Theory and realization of as ynchronous, selftimed and self-synchronized circuits. Project continuation.

Also offered as ECE 673 and may be taken only once for credit. . Prerequisite: ECE 572/672.

## ECE 574 -High-level Synthesis andDesign Automation (4)

Comprehensive design automation systems. Problems of system and high-level synthesis. Register-transfer and hardware description languages. Data path design: scheduling and allocation. Design methods for sy stolic, pipelined, cellular and dynamic architectures. System is sues. System-level silicon compilers. Group project: using high-level tools for design of a complete VLSI ASIC chip or FPGA architecture: vision, DSP, or controller.

Also offered as ECE 674 and may be taken only once for credit. Prerequis ite: ECE 573/673.

## ECE 575 - Introduction to Integrated Circuit Test (4)

Course will cover the traditional role of IC test in parametric and functional testing and the changing role of IC testing in semiconductor design and manufacturing. The course is divided into three parts. The first part reviews integrated circuit technologies and fault modeling. The second introduces digital IC test, DCparametric testing, and functional and structural testing. The third part examines technology trends.
Also offered as ECE 675 and may be taken only once for credit. . Prerequisite: ECE 425/525, ECE 416/516.

## ECE 576-Computational Methods in Electrical Engineering (4)

Students are introduced to advanced mathematical techniques applicable to electrical engineering. Content includes topics such as: optimization techniques, solution of partial differentialequations, solution of eigenvalue problems, Fourier methods, vector space operations, and complex variable theory. Additional mathematical topics will be introduced as application examples at the discretion of the instructor.

Also offered as ECE 676 and may be taken only once for credit. . Prerequisite: graduatestanding.

## ECE 577 -Interactive Computer Graphics (4)

An introduction to the principles of interactive computer graphics including logical devices, physic al devices, transformation, viewing and clipping in two and three dimensions.

Prerequisite: ECE 575/675.

## ECE 578 - Intelligent Robotics I (4)

Basic problems of intelligent robotics. Hardware for Artificial Intelligence and Robotics. Formulation and reduction of problems. Tree search. Predicate calculus and resolution method. Methods of formulating and solving problems in logic programming. Fuzzy Logic. Logic programming and artificial intelligence in robot systems. Reasoning by analogy and induction. Associative processors.
Also offered for undergraduate-level credit as ECE 478 and may be taken only once for credit. . Prerequisite: ECE 372.

## ECE 579 - Intelligent Robotics II (4)

Sensors. Computer vision hardware. Problems in image processing, vision, manipulation, and planning. Machines for image processing and computer vision. Morphological processors. Manufacturing inspection. Non-numeric computers. Path planning. Localization. Use of reas oning and learning. Applications in scheduling, planning, and as signment. Computer architectures for robotics. Integrated robotic systems for manufacturing. Architectures of comprehensive mobile robots. Robots in health care. Sy stemintegration. Examples of application.

Als o offered for undergraduate-level credit as ECE 479 and may be taken only once for credit. . Prerequisite: ECE 478/578.

## ECE 581 - ASIC: Modeling and Synthesis (4)

Covers the fundamentals of the ASIC design process. The topics include ASIC designFlow, basic HDLconstructs, test benches, modeling combinational and synchronous logic, modeling finite state machines, multiple clock domain designs, qualitative design is sues, ASIC constructions.

Also offered for undergraduate-level credit as ECE 481 and may be taken only once forcredit. . Prerequisite: ECE 371.

## ECE 582 - Formal Verification of Hardware/Software Systems (4)

Objective is to introduce the main formal verification methods of hardware/software systems. Topics to be covered include: formal logics for systemverification (first-order logic, higher order logic, temporal logic),
formal specifications, theoremproving systems, microproces sor verification, and system software verifications.

Also offered as ECE 682 and may be taken only once for credit. . Prerequisite: ECE 371, or CS 321, CS 333.

## ECE 583 - Low Power Digital IC Design (4)

Introduction to the existing techniques for IC power modeling, optimization, and synthesis. Topics include: sources of power dis sipation, design for low power, voltage scaling approaches, power analysis techniques, power optimization techniques, low-power system-level designs. Focus on abstraction, modeling, and optimization at all levels of design hierarchy, including the technology, circuit, layout, logic, architectural, and algorithmic levels.

Also offered for undergraduate-level credit as ECE 483 and may be taken only once for credit. . Prerequisite: ECE 425/525.

## ECE 584 - Foundations of Cyber-Physical Systems (4)

Introduction to the design of microcontroller based embedded systems. Focus is on embedded systems where design seamlessly integrates computational resources with physical systems. Topics covered includes ampling theory, sens or/actuator interfacing, real-time and fault-tolerant embedded systemdesign. Basics of wireless sensor networks. Modeling and formal verification techniques.
Prerequisite: Graduate standing.

## ECE 585-Microprocessor SystemDesign (4)

Advanced hardware and software design of desktoptype microcomputer systems. Topics include large project design management and documentation; DRA Msystem design, cacheorganization, connections, and coherency; the memory hierarchy and virtual memory; I/O buses such as AGP, PCI-X, and Infiniband; multithreaded operating systemconsiderations; JTAG(IEEE1149.1) and Design For Test; high frequency signal integrity; and power supply considerations. Team-based, independent design projects are a substantial part of the homework for this class.
Also offered for undergraduate-level credit as ECE 485 and may be taken only once for credit. . Prerequisite: ECE 372.

## ECE 586 - Computer Architecture (4)

An introduction to the key concepts of computer system architecture and design. Topics include the design and analys is of instruction set architectures, memory systems, and high-performance IO systems; basic CPU implementation strategies; basic pipelined CPU implementation; performance analysis; and a survey of current architectures.

Also offered for undergraduate-level credit as ECE 486 and may be taken only once for credit. . Prerequisite: ECE 485/585.

## ECE 587 - Advanced Computer Architecture I(4)

An advanced course in computer systemarchitecture and design. Key topics include advanced CPU implementation techniques including pipelining, dynamic instruction issue, superscalar architectures, and vector processing; high performance memory and IO systems design; an introduction to parallel computers; and a survey of current literature in computer architecture and of current advanced computer systems. Students will begin a project that will be completed in ECE 588/688.
Also offered as ECE 687 and may be taken only once for credit. . Prerequisite: $486 / 586$.

## ECE 588 - Advanced Computer Architecture II (4)

Discus sion of parallel computer architectures and their uses. Key topics include MIMD architectures; associative processing; shared-memory and message-passing architectures; dataflow and reduction architectures; special-purpose processors; design and analysis of interconnection networks; and an overview of parallel software is sues. Students will complete the project started in ECE 587/687.
Also offered as ECE 688 and may be taken only once for credit. . Prerequisite: ECE 587/687.

## ECE 589 - Performance Analysis of Local Area Networks (4)

Studies the structure and performance of local computer networks. Emphasis on performance is sues for common protocols used in localcomputer networks. Specifically, polling networks, rings networks, and random-access networks. Allows the student to analyze network performance and read the current literature.

## ECE 590 - Digital Design Using Hardware Description Languages (4)

An introductory graduate clas s to digital design using hardware description languages and to advanced digital design for programmable devices. Class covers the following topics: fundamentals of Hardware Description Languages; VHDL syntaxand semantics; behavioral, functional, structural and regis ter-transfer descriptions; combinational circuits; finite state machines; levels of systemsimulation; arithmetic and sequentialblocks and interfaces; pipelined and systolic processors; advanced VHDL language features and extensions; specification of controllers and data path architectures; reconfigurable Field Programmable Gate Array systems; verilog for VHDL programmers. Students mustcompletetwo computer-based software mini-projects and a project.

Also offered as ECE 690 and may be taken only once for credit. . Prerequisite: graduate standing in ECE.

## ECE 591 - Laser Systems Design I (4)

Laser topics: especially design of laser, fiberoptic, and related optical systems. Formation and propagation of modes and beams, matrix methods for the analysis and synthesis of optical systems.
Also offered for undergraduate-level credit as ECE 491 and may be taken only once for credit. . Prerequisite: ECE 331.

## ECE 592 - Laser Systems Design II (4)

Interaction of light with atoms, Maxwell Schrodinger analys is and rate equation approximations. Effects of gain, dis persion, and saturation in the design of laser amplifiers and oscillators.

Also offered for undergraduate-levelcredit as ECE 492 and may be taken only once for credit. .

## ECE 593 - Fundamentals of Pre-Silicon Validation (4)

Introduction to theory, strategy, and methods to validate functionality of digital integrated circuit using simulation based techniques. Topics include complete validation flow, validation environment, stimulus, checking, and coverage. Familiarity with computer architecture and SystemVerilog is required. A design project is an integral part of this course.
Prerequisite: ECE 571 or permis sion of instructor.

## ECE 594 - Applied Optics (4)

An overview of optics and such principal applications as fiberoptics; chemical, biological, and physical sensors; optical information processing, acousto-optics; lasers and detectors. This course is the same as Ph 564 ; course may only be taken once for credit. Recommended prerequisites: Ph 203 or 213 or 223 , Mth 261.
Cross-Listed as: Ph 564.

## ECE 595 - Emulation and Functional Specification Verification (4)

Introduction to theory and techniques to verify digital circuit designs with emphasis on non-simulation methods. Topics include hardware emulation, formal verification, and abstract system specification. Familiarity with computer architecture and SystemVerilog is required. A design verification project is an integral part of this course.
Prerequisite: ECE 571 or permis sion of instructor.

## ECE 596-Optoelectronics II (4)

Nonlinearoptics, parametric oscillation, frequency conversion, self-focusing, acousto-optics, Brillouin scattering, Raman scattering, magneto-optics, opto-optics.

## ECE 597 -Post-Silicon Electrical Validation (4)

Methods, tools, and processes used to validate electrical concerns of modern electronic designs, including silicon, circuit boards, and communication interfaces. Includes validation of design specifications and manufacturing processes. Hardware and software tools. Special emphasis to complex microproces sor based systems, though material applicable to any electronic system.
Prerequisite: Graduate standing in ECE or permis sion of instructor.

## ECE 598 - Introduction to Quantum Mechanics (4)

An introduction to the formulation and application of wave mechanics; the Schrodingerequation and its application to time-independent problems (both one- and threedimensional problems); identical particles; approximation methods including mainly time-independent perturbations. Brief exploration of the potential applications of quantum mechanics to engineering: quantumnano-structures and quantum computers. This course is the same as Ph 511 ; course may only be taken once for credit. Recommended prerequisites: Ph 318 or 311, Mth 261.
Cross-Listed as: Ph 511.
ECE 601 -Research (1-12)
(Credit to be arranged.)

## ECE 602 -Independent Study (1-9)

(Credit to be arranged.)

## ECE 603 -Dissertation (1-12)

(Credit to be arranged.)

ECE 604 -Cooperative Education/Internship (1-9)
(Credit to be arranged.)

ECE 605 - Reading And Conference (1-9)
(Credit to be arranged.)

ECE 606 -Special Problems/Projects (1-9)
(Credit to be arranged.)

ECE 607 -Seminar (1-9)
(Credit to be arranged.)

## ECE 610 -SelectedTopics (1-9)

(Credit to be arranged.)

## ECE 611 -SolidState Eectronics I (4)

The solid state electronics course sequence deals with advanced topics in solid state device physics and modeling. Following a discussion on semiconductor properties and modeling as a function of doping and temperature, ad vanced bipolar transistor structures andMOS transistors will be treated in detail. Device models aimed at numerical circuit simulators will be discussed. This is the first course in a sequence of three: ECE 611, ECE 612, and ECE 613.
Also offered for ECE 511 and may be taken only once for credit. .

## ECE 612 -SolidState Electronics II (4)

The solid state electronics course sequence deals with advanced topics in solid state device physics and modeling. Following a discussion on semiconductor properties and modeling as a function of doping and temperature, advanced bipolar transistor structures andMOS transistors will be treated in detail. Device models aimed at numerical circuit simulators will be discussed. This is the second course in a sequenceof three: ECE 611, ECE 612, and ECE 613.
Also offered for ECE 512 and may be taken only once for credit. .

## ECE 613 -SolidState Eectronics III (4)

The solid state electronics course sequence deals with advanced topics in solid state device physics and modeling. Following a dis cussion on semiconductor properties and modeling as a function of doping and temperature, advanced bipolar transistor structures andMOS transistors will be treated in detail. Device models aimed at numerical circuit simulators will be discussed. This is the third course in a sequence of three: ECE 611, ECE 612, and ECE 613.
Prerequisite: ECE 323.

## ECE 623 - Analog Integrated Circuit Design III (4)

Integrated-circuit oscillators and timers, frequency-tovoltage converters, phase-locked-loop circuits, IC filters, self-tuning filters, digital-to-analog converters, analog-todigital converters, CAD tools for circuit design and testing.
Also offered for ECE 523 and may be taken only once for credit. . Prerequisite: ECE 422/522.

## ECE 624 - Advanced Embedded In Silicoand In Materio Computing (4)

Introduces and develops the advanced hardware and software concepts, design methodologies, and
programming paradigms of emerging embedded in silico and in materio computing systems. Topics covered: physics of computation, spatial computing paradigms, selfas sembly and self-organization, morphogenetic systems, molecular and nano-scale computing, non-classical computing and non-classical programming paradigms, amorphous computing.
Also offered as ECE 524 and may be taken only once for credit. . Prerequisite: ECE 371 or permis sion of the instructor.

## ECE 627 -High-performance Digital Systems (4)

The use of computer-aided design tools in high performance digital systems is explored. The trade-offs between automated and hand design are examined in the context of performance vs. de velopment time. The impact of new developments in MOS circuit technology are also examined.
Also offered as ECE 527 and may be taken only once for credit. . Prerequisite: ECE 426/526.

## ECE 629 -CAD for ULSI and Emerging Technologies

 (4)Course will cover Computer-Aided Design(CAD) challenges for ultra submicron CMOS system design and circuit and systemdes ign in new emerging technologies. It will cover(1) systemdesign approaches and optimization techniques in the presence of process andenvironmental parameter variations (2) statistical approaches to circuit and systemdesign, (3) physicaldesign (layout) role in performance evaluation of digital systems, and (4) design and architecture outlook for beyond CMOS Switches.
Also offered as ECE 529 and may be taken only once for credit. . Prerequisite: ECE 428/528 or consent of instructor.

## ECE 633 - Advanced Electromagnetics (4)

Advanced course in electromagnetics. Mathematical methods, electrostatics, boundary value problems, magnetostatics, time varying fields, plane waves.
Also offered as ECE 533 and may be taken only once for credit. .

## ECE 634 -Acoustics (4)

Fundamentals of linear acoustics: acoustic wave equations, scattering theory and acoustic propagation. Numerical techniques. Applications emphasizing underwater acoustics and medical ultrasound.

Also offered as ECE 534 and may be taken only once for credit. . Prerequisite: graduatestanding.

## ECE 635 -Electromagnetic Fields and Interactions (4)

Classical description of the electromagnetic field: classical electron theory and plasmas. This course is the same as Ph 631, Ph 632, Ph 633; course may only be taken once for
credit. This is the first course in a sequence of three: ECE 635, ECE 636, and ECE 637.

Prerequisite: ECE 331 or Ph 431. Cross-Listed as: Ph 631.

## ECE 636 - Electromagnetic Fields and Interactions (4)

Classical description of the electromagnetic field: classical electron theory and plasmas. This course is the same as Ph 631, Ph 632, Ph 633; course may only be taken once for credit. This is the second course in a sequence of three: ECE 635, ECE 636, and ECE 637.

Prerequisite: ECE 331 or Ph 431 . Cross-Listed as: Ph 632.
ECE 637 - Electromagnetic Fields and Interactions (4)
Classical description of the electromagnetic field: classical electron theory and plasmas. This course is the same as Ph 631, Ph 632 , Ph 633; course may only be taken once for credit. This is the third course in a sequence of three: ECE 635, ECE 636, and ECE 637.
Prerequisite: ECE 331 or Ph 431. Cross-Listed as: Ph 633.

## ECE 638 -Statistical Signal Processing I: Nonparametric Estimation (4)

Unified introduction to the theory, implementation, and applications of statistical signal processing methods. Focus on estimation theory, randomsignal modeling, characterization of stochastic signals and systems, and nonparametric estimation. Designed to give a solid foundation in the underlying theory balanced with a discussion of the practical advantages and limitations of nonparametric estimation methods. Also offered as ECE 538 and may be taken only once for credit.

Also offered as ECE 538 and may be taken only once for credit. .

## ECE 639 - Statistical Signal Processing II: Linear Estimation (4)

Unified introduction to the theory, implementation, and application of statistical signal processing methods. Focus on optimumlinear filters, least square filters, the Kalman filter, signal modeling, and parametric spectral estimation. Designed to give a solid foundation in the underlying theory balanced with examples of practical applications and limitations. Recommended: ECE 538/638. ECE 541 Transmis sion Operation and Control, (4) Introduces the following topics: state estimation, security analysis, contingency monitoring, optimal power flow, reliability, interchangeof energy, market and pooloperation. Also offered as ECEd 539 and may be taken only once for credit.

Also offered as ECEd 539 and may be taken only once for credit. .

## ECE 653 - Control Systems Design III (4)

Topics in modern feedback control theory of nonlinear and multivariable systems, including considerations of stochastic and optimal control. Design methods of computer workstations.
Prerequisite: ECE 452/552.

## ECE 667 -Statistical Communications Theory (4)

As an advanced course in communication theory, topics of statistical decision, estimation, and modulation theory are introduced. Statistical as pects of transmis sion detection and error detection/correction schemes are covered.
Also offered as ECE 567 and may be taken only once for credit. . Prerequisite: ECE 461/561, 565/665.

## ECE 672 - Advanced Logic Synthesis (4)

Boolean and multivalued algebras. Cube calculus and its computer realization. Basic operators and algorithms of function minimization. Decomposition and factorization theories. Multilevel minimization. Orthogonal expansions and tree circuits. Cellular logic and its applications to Field Programmable Gate Arrays. Spectral theory of logic optimization. Ordered Binary and Multiple-Valued Decision Diagrams. Design for speed, testability, power consumption, reliability, Reed-Mullerforms, and EXOR circuits. Technology mapping. Modern logic synthesis programs, systems, and methodologies. Project that continues in ECE 573.

Also offered as ECE 572 and may be taken only once for credit. .

## ECE 673 - Control Unit Design (4)

Synchronous logic, Finite State Machines: and Moore and Mealy models. Design of FSMs fromregularexpressions, nondeterminis tic automata, Petri Nets and parallel program schemata. Partitioned control units. Cellular automata. Realization, minimization, assignment and decomposition of FSMs. Partition and decomposition theory and programs. Micro-programmed units. Microprogram optimization. Theory and realization of as ynchronous, selftimed and self-s ynchronized circuits. Project continuation.
Also offered as ECE 573 and may be taken only once for credit. . Prerequisite: ECE 572/672.

## ECE 674 -High-level Synthesis andDesign Automation

 (4)Comprehensive design automation systems. Problems of systemand high-level synthesis. Register-transfer and hardware description languages. Data path design: scheduling and allocation. Design methods for systolic, pipelined, cellular and dynamic architectures. System is sues. System-level silicon compilers. Group project: using high-level tools for des ign of a complete VLSI ASIC chip orFPGA architecture: vision, DSP, or controller.

Also offered as ECE 574 and may be taken only once for credit. Prerequisite: ECE 573/673.

## ECE 675 - Introduction to Integrated Circuit Test (4)

Course will cover the traditional role of IC test in parametric and functional testing and the changing role of IC testing in semiconductor design and manufacturing. The course is divided into three parts. The first part reviews integrated circuit technologies and fault modeling. The second introduces digital IC test, DCparametric testing, and functional and structural testing. The third part examines technology trends.

Also offered as ECE 575 and may be taken only once for credit. . Prerequisite: ECE 425/525, ECE 416/516.

## ECE 676 - Computational Methods in Electrical Engineering (4)

Students are introduced to advanced mathematical techniques applicable to electrical engineering. Content includes topics such as: optimization techniques, solution of partial differentialequations, solution of eigenvalue problems, Fourier methods, vector space operations, and complex variable theory. Additional mathematical topics will be introduced as application examples at the discretion of the instructor.

Also offered as ECE 576 and may be taken only once for credit. . Prerequisite: graduate standing.

## ECE 677 - Interactive Computer Graphics (4)

An introduction to the principles of interactive computer graphics including logical devices, physicaldevices, transformation, viewing and clipping in two and three dimensions.

Prerequisite: ECE 575/675.

## ECE 682 - Formal Verification of Hardware/Software Systems (4)

Objective is to introduce the main formal verification methods of hardware/software systems. Topics to be covered include: formal logics for system verification (first-order logic, higher order logic, temporal logic), formal specifications, theoremproving systems, microproces sor verification, and systemsoftware verifications.

Also offered as ECE 582 and may be taken only once for credit. . Prerequisite: ECE 371, or CS 321, CS 333.

## ECE 687 - Advanced Computer Architecture I(4)

An advanced course in computer systemarchitecture and design. Key topics include advanced CPU implementation techniques including pipelining, dynamic instruction issue, superscalar architectures, and vector processing; high performance memory and IO systems design; an introduction to parallel computers; and a survey of current literature in computer architecture and of current advanced
computer systems. Students will begin a project that will be completed in ECE 588/688.

Also offered as ECE 587 and may be taken only once for credit. . Prerequisite: $486 / 586$.

## ECE 688 - Advanced Computer Architecture II (4)

Discus sion of parallel computer architectures and their uses. Key topics include MIMD architectures; associative processing; shared-memory and mes sage-passing architectures; dataflow and reduction architectures; special-purpose processors; design and analysis of interconnection networks; and an overview of parallel software is sues. Students will complete the project started in ECE 587/687.

Also offered as ECE 588 and may be taken only once for credit. . Prerequisite: ECE 587/687.

## ECE 689 - Performance Analysis of Local Area Networks (4)

Studies the structure and performance of local computer networks. Emphasis on performance is sues for common protocols used in localcomputer networks. Specifically, polling networks, rings networks, and random-access networks. Allows the student to analyze network performance and read thecurrent literature.

## ECE 690 -Digital Design Using Hardware Description Languages (4)

An introductory graduateclass to digital design using hardware description languages and to advanced digital design for programmable devices. Class covers the following topics: fundamentals of Hardware Description Languages; VHDL syntaxand semantics; behavioral, functional, structural and register-transfer descriptions; combinational circuits; finite state machines; levels of systemsimulation; arithmetic and sequential blocks and interfaces; pipelined and systolic processors; advanced VHDL language features and extensions; specification of controllers and data path architectures; reconfigurable Field Programmable Gate Array systems; verilog for VHDL programmers. Students must completetwo computer-based software mini-projects and a project.

Also offered as ECE 590 and may be taken only once for credit. . Prerequisite: graduate standing in ECE.

## ECE 696 - Optoelectronics II (4)

Nonlinear optics, parametric oscillation, frequency conversion, self-focusing, acousto-optics, Brillouin scattering, Raman scattering, magneto-optics, opto-optics.

# ECED - Early Childhood Education \& Development 

ECED 406-Special Projects (1-6)
(Credit to be arranged.)

## ECED 410-SelectedStudies (1-12)

(Credit to be arranged.)

## ECED 421 -Supervision in Early Childhood Education Settings (3)

Integrates theory and research of adult and professional development with supervisory models and practices appropriate for early childhoodeducation settings. Expected preparation:Undergraduate early childhood education coursework or teaching experience with young children.

Also offered for graduate-level credit as ECED 521 and may be taken only once for credit. .

## ECED 422 - Advanced CurriculumDesignin Kindergarten/ Primary Grades (3)

This course will consider growth and development characteristics of children ages $5-8$ years and research on teaching forplanning educational programs, curricula, instruction, environment, management, and guidance.

Also offered for graduate-level credit as ECED 522 and may be taken only once for credit.

## ECED 423 -Leading in ECE Programs (4)

Develop a strong sense of early childhood leadership identity through multiple lenses of directing, teamwork, and/or coordinating clas sroom pedagogy and practice. Explore leadership roles in schools for young children including: teachers, supervis ors, children, and parents. Collaborative and relational dimensions of the early childhood profession are also explored.
Also offered for graduate-level credit as ECED 523 and may be taken only once for credit. . Prerequisite: Undergraduate early childhood education coursework or teaching experience with young children or instructor's approval.

## ECED 424 - Creating Communities: Guiding Young Children (2)

Students focus on fostering children's sense of belonging through the course by examining four central themes: framing community, supporting emerging identities, establishing a clas sroom culture, and developing problemsolving strategies. Students will draw on social constructivistand critical perspectives in designing
equitable classroomcommunities and in developing practical approaches as they guide children in their own learning.
Also offered for graduate-level credit as ECED 524 and may be taken only once for credit. Prerequisite:
Undergraduate early childhood education coursework or teaching experience with young children or instructor's approval.

## ECED 425 -Culture and Language in Early Childhood Families (3)

Students construct a complexunderstanding of children and families in early childhood settings grounded in diverse cultural and political contexts. Students explore the role of theory in providing frameworks for understanding and interpreting child and family development in the early childhood classroom, including the identity development of immigrants and refugees. Explore the role of language acquisition froma strength-based perspective, including understanding the relationship between language and culture and bilingual development.
Also offered for graduate-level credit as ECED 525 and may be taken only once for credit. Prerequisite:
Undergraduate early childhood education coursework or teaching experience with young children or instructor's approval.

## ECED 426 -Mathematical Thinking in Early Childhood (3)

Examine ideas and practices that help young children learn mathematics in diverse contexts. Students considerhow mathematical ideas emerge fromchildren's real-life experiences in cultural settings and how to support math acquisition through play. Reflect on and create activities that are grounded in research about children's development in numeracy and other math concepts. Explore how to nurture mathematical understanding through reflection, environmentaldesign, the use of literature and games, and responsiveness to cultural diversity.

Also offered for graduate-levelcredit as ECED 526 and may be taken only once for credit. Prerequisite: Underg raduate early childhood education coursework or mathematics coursework or teaching experience with young children or instructor's approval.

## ECED 427 - Inspirations in Early Childhood <br> Education: The Reggio Emilia Approach (1)

Explore educational ins pirations central to the infant, toddler and preprimary schools of Reggio Emilia, Italy, and unpacks the implications of this cultural and political context. Through readings, video, and dialogue, examine core concepts including image of the child, the hundred languages of children, the atelier, the environment as third teacher, project work, pedagogical documentation, and the
role of family and civic participation. Engage in in-depth exploration of an is sue or topic of particular relevance.

Also offered for graduate-level credit as ECED 527 and may be taken only once for credit. Prerequisite: Undergraduate early childhood education course work or teaching experience with young children or instructor's approval.

## ECED 428 - Educational Rights and Inclusive Environments in Early Childhood (3)

Explores the collaborative bridge between the work of the early childhood classroomteacher and the intervention services needed to establish a truly inclusive clas sroom. Students will draw on social constructivist perspectives in developing classroomenvironments, pedagogy and curricula that ensure full access for all children and that recognize children's s trengths and educational "rights" (not needs) in order to ensure equity.
Also offered for graduate-level credit as ECED 528 and may be taken only once for credit. Prerequisite: Undergraduate early childhood education coursework or teaching experience with young children or ins tructor's approval.

## ECED 429 - Art as Languages of Early Childhood (3)

Consider children's engagement in artistic and representational processes as a means of co-constructing knowledge. Challenge the as sumption that children's art is product-based and reframe the way we understand how the creative process contributes to learning and identity. Develop ways to facilitate creative expression and incorporate the arts into early childhood curriculum. Learn techniques for introducing children to drawing, painting, clay, wire, three-dimensional and digital media as tools for exploring ideas and creating theories.
Also offered for graduate-level credit as ECED 529 and may be taken only once for credit. Prerequisite:
Undergraduate early childhood education coursework or teaching experience with young children or instructor's approval.

## ECED 430 - The Emotional Life of Toddlers (3)

Explore diverse caregiving practices designed to support learning during the toddler years, a critical period of social and emotionaldevelopment. Links are made between theories and brain development research to the activities that educators implement every day with toddlers. Topics include observing, es tablis hing nurturing relationships, planning secure environments, designing learning experiences to engage and reflect very young children from diverse cultural contexts, and implementing positive guidance strategies to support emotional well-being and identity development.
Also offered for graduate-level credit as ECED 530 and may be taken only once for credit. Prerequisite:

Undergraduateearly childhood education coursework or teaching experience with young children or instructor's approval.

## ECED 460 - Inclusive Early Childhood Models (3)

Presents different approaches to early childhood education with a focus on inclusion and consultation in typical early childhood settings. Provides a framework for recommended practices for supporting young children with disabilities in early childhood settings. Discusses the underlying concepts and application of developmentally appropriate practice.

Also offered for graduate-level credit as ECED 560 and may be taken only once for credit. . Prerequis ite: Upperdivision standing.

## ECED 471 - Play: Curriculumin Early Childhood Education (3)

Inquiry into theory and research on play, including cultural contexts and meaning of play in early childhood. Develop a theoretical and working understanding of adult roles in the facilitation of play, including the role of development, culture, gender, and ability. Practice observation of children's play as a context for as sessment and documentation. Review, develop, and implement curriculum with a focus on play in child-centered inclusive approaches that draw on children's diverse strengths and contexts.

Also offered for graduate-levelcredit as ECED 571 and may be taken only once for credit. Prerequisite: Undergraduateearly childhood education coursework or teaching experience with young children or instructor's approval.

## ECED 472 -Language and Literacy in Early Childhood Education (3)

Helps teachers understand, as sess, and promote early experiences with language that contribute to the process of becoming literate. Expected preparation: Undergraduate early childhoodeducation coursework or teaching experience with young children.
Also offered for graduate-level credit as ECED 572 and may be taken only once for credit. .

## ECED 477 -Learning Designs: Early Childhood Environments (3)

Study of quality learning environments and design, emphasizing the roles of children's learning, adult engagement, and theenvironment as the third teacher. Investigate s pace planning, programlayout, design theories, and aesthetic values.
Also offered for graduate-levelcredit as ECED 577 and may be taken only once for credit. . Prerequisite: Junior level standing or prior coursework in child development.

## ECED 478-Constructivist Curriculum: Big Ideas in Early Childhood Education (3)

Examines the possibilities of exploring big ideas deeply over time and across the curriculum with preschool and primary age children. Focuses on the ways that integrated curriculumand project work support children's learning and foster the connections necessary for themto construct knowledge. Students have the opportunity to develop res ources and design classroomexperiences related to big ideas.

Also offered for graduate-level credit as ECED 578 and may be taken only once for credit. . Prerequisite: Junior level standing or prior coursework in child development.

## ECED 479 - Young Child as Scientist (3)

Explores developmentally appropriate science for preschool and primary age children, focusing on experimentation and problem-solving. Students experience and design activities for young children around three questions that derive fromtraditional science content: can I make it move, can I make it change, and how does it fit? In the process, students will learn more about constructivist teaching and curriculum, particularly as applied to science education.

Also offered for graduate-level credit as ECED 579 and may be taken only once for credit. . Prerequis ite: Junior level standing or prior coursework in child development.

## ECED 501 - Research (1-9)

(Credit to be arranged.)

## ECED 505 - Reading and Conference (1-4)

(Credit to be arranged.)

## ECED 506 - Problems/Projects (1-6)

(Credit to be arranged.)

## ECED 507 -Seminar (1-9)

(Credit to be arranged.)

## ECED 508-Workshop(1-8)

(Credit to be arranged.)

## ECED 509-Practicum (1-9)

(Credit to be arranged.)

## ECED 510 -SelectedStudies (1-9)

(Credit to be arranged.)

## ECED 521 -Supervision in Early Childhood Education Settings (3)

Integrates theory and research of adult and professional development with supervis ory models and practices appropriate for early childhood education settings. Expected preparation: Undergraduate early childhood education coursework or teaching experience with young children.

Also offered for undergraduate-level credit as ECED 421 and may be taken only once for credit. .

## ECED 522 - Advanced CurriculumDesignin Kindergarten/ Primary Grades (3)

This course will consider growth and development characteristics of children ages 5-8 years and research on teaching for planning educational programs, curricula, instruction, environment, management, and guidance.

Also offered for undergraduate-level credit as ECED 422 and may be taken only once forcredit.

## ECED 523 -Leading in ECE Programs (4)

Develop a strong sense of early childhood leadership identity through multiple lenses of directing, teamwork, and/or coordinating clas sroompedagogy and practice. Explore leadership roles in schools for young children including: teachers, supervis ors, children, and parents. Collaborative and relational dimensions of the early childhood profession are also explored.
Also offered for undergraduate-level credit as ECED 423 and may be taken only once forcredit. . Prerequisite: Undergraduateearly childhood education coursework or teaching experience with young children or instructor's approval.

## ECED 524 - Creating Communities: Guiding Young Children (2)

Students focus on fostering children's sense of belonging through the course by examining four central themes: framing community, supportingemerging identities, establishing a clas sroom culture, and de veloping problemsolving strategies. Students will draw on social constructivist and critical perspectives in designing equitable classroomcommunities and in developing practical approaches as they guide children in their own learning.

Also offered for undergraduate-level credit as ECED 424 and may be taken only once for credit. Prerequisite: Undergraduateearly childhood education coursework or teaching experience with young children or instructor's approval.

## ECED 525-Culture and Language in Early Childhood Families (3)

Students construct a complexunderstanding of children and families in early childhood settings grounded in diverse cultural and political contexts. Students explore the role of theory in providing frameworks for understanding and interpreting child and family development in the early childhood classroom, including the identity development of immigrants and refugees. Explore the role of language acquisition froma strength-based perspective, including understanding the relationship between language and culture and bilingual development.
Also offered for undergraduate-levelcredit as ECED 425 and may be taken only once for credit. Prerequisite: Undergraduate early childhood education coursework or teaching experience with young children or ins tructor's approval.

## ECED 526 - Mathematical Thinking in Early Childhood (3)

Examine ideas and practices that help young children learn mathematics in diverse contexts. Students consider how mathematical ideas emerge fromchildren's real-life experiences in cultural settings and how to support math acquis ition through play. Reflect on and create activities that are grounded in research about children's development in numeracy and other math concepts. Explore how to nurture mathematical understanding through reflection, environmental design, the use of literature and games, and responsiveness to cultural diversity.
Also offered for undergraduate-level credit as ECED 426 and may be taken only once for credit.

## ECED 527 - Inspirations in Early Childhood Education: The Reggio Emilia Approach (1)

Explore educational inspirations central to the infant, toddler and preprimary schools of Reggio Emilia, Italy, and unpacks the implications of this cultural and political context. Through readings, video, and dialogue, examine core concepts including image of the child, the hundred languages of children, the atelier, the environment as third teacher, project work, pedagogical documentation, and the role of family and civic participation. Engage in in-depth exploration of an is sue or topic of particular relevance.
Also offered for undergraduate-level credit as ECED 427 and may be taken only once for credit.

## ECED 528 - Educational Rights and Inclusive Environments in Early Childhood (3)

Explores the collaborative bridge between the work of the early childhood classroomteacher and the intervention services needed to establish a truly inclusive clas sroom. Students will draw on social constructivist perspectives in developing classroomenvironments, pedagogy and curricula that ensure full access for all children and that
recognize children's strengths and educational "rights" (not needs) in order to ens ure equity.

Also offered for undergraduate-level credit as ECED 428 and may be taken only once for credit. Prerequisite: Undergraduateearly childhood education coursework or teaching experience with young children or instructor's approval.

## ECED 529 - Art as Languages of Early Childhood (3)

Consider children's engagement in artistic and representational processes as a means of co-constructing knowledge. Challenge the as sumption thatchildren's art is product-based and reframe the way we understand how the creative process contributes to learning and identity. Develop ways to facilitate creative expression and incorporate the arts into early childhood curriculum. Learn techniques for introducing children to drawing, painting, clay, wire, three-dimensional and digital media as tools for exploring ideas and creating theories.

Also offered for undergraduate-level credit as ECED 429 and may be taken only once for credit.

## ECED 530 - The Emotional Life of Toddlers (3)

Explore diverse caregiving practices designed to support learning during the toddler years, a critical period of social and emotional development. Links are made between theories and brain development research to theactivities that educators implement every day with toddlers. Topics include observing, establishing nurturing relationships, planning secure environments, designing learning experiences to engage and reflect very young children from diverse cultural contexts, and implementing positive guidance strateg ies to support emotional well-being and identity development.
Also offered for undergraduate-level credit as ECED 430 and may be taken only once forcredit. Prerequisite: Undergraduateearly childhood education coursework or teaching experience with young children or instructor's approval.

## ECED 550 - Foundations in Early Childhood and Inclusive Education (4)

Focus on foundations of and approaches to inclusive early childhood education. Learn about de velopmental and inclusive practices, develop foundational knowledge and examine and challenge assumptions about inclusive teaching and learning.

Prerequisite: Admis sion to the Masters in Early Childhood Education:InclusiveEducation and Curriculumand Instruction.

## ECED 551 - Child Development and Critical

 Perspectives in Inclusive Early Childhood Education (4)Critically examine theories of development and their application to young children with differing and emerging abilities, contexts, and identities. Unpack the dominant narratives reg arding child development and explore counter narratives and alternative perspectives reg arding learning and development across culture. Explore differing domains of development (cognitive, social-emotional, etc.) in the early childhood years with a focus on the implications for educational practice guided by equity and a strong and compleximage of the child.
Prerequisite: Admission to the Masters in Early Childhood Education: InclusiveEducation.

ECED 552 - Social Justice and Transformative Practice in Early Childhood Inclusive Education (4)
Explore the cultural his tories and social identities of self and colleagues to gain insight into diverse lived experiences and the impact of bias and privilege. Recognize how young children are actively constructing meaning about differences and similarities in communities and society. Learn about transformative teaching practices framed by a culturally sustaining model, anti-bias education goals, and a vision of social justice. Develop learning experiences to ensure equity for children and their families in diverse settings.

## ECED 553 - Contemporary Issues in Early Childhood and Inclusive Education (4)

Study contemporary issues related to inclusion in early childhood programs for children of all ability levels. Identify and respond to critical issues in contemporary early childhoodeducation as it relates to inclusion. Analyze those issues froma variety of pers pectives.
Prerequisite: Admission to the Masters in Early Childhood Education: Inclusive Education.

## ECED 560 - Inclusive Early Childhood Models (3)

Presents different approaches to early childhood education with a focus on inclusion and consultation in typical early childhood settings. Provides a framework for recommended practices for supporting young children with dis abilities in early childhood settings. Discusses the underlying concepts and application of developmentally appropriate practice.
Also offered for undergraduate-level credit as ECED 460 and may be taken only once for credit.

## ECED 571 - Play: Curriculumin Early Childhood Education (3)

Inquiry into theory and research on play, including cultural contexts and meaning of play in early childhood. Develop a theoretical and working understanding of adult roles in the facilitation of play, including the role of development, culture, gender, and ability. Practice observation of children's play as a context for as sessment and documentation. Review, develop, and implement curriculum with a focus on play in child-centered inclusive approaches that draw on children's diverse strengths and contexts.
Also offered for undergraduate-level credit as ECED 471 and may be taken only once for credit. Prerequis ite: Undergraduateearly childhood education coursework or teaching experience with young children.

## ECED 572 -Language and Literacy in Early Childhood Education (3)

Helps teachers understand, as sess, and promote early experiences with language that contribute to the process of becoming literate. Expected preparation: Undergraduate early childhoodeducation coursework or teaching experience with young children.

Also offered for undergraduate-level credit as ECED 472 and may be taken only once for credit. .

## ECED 573 - Assessment and Technology in Early Childhood Education (3)

Study of and experience with a range of developmentally appropriate assessment and technology strategies for use in diagnostic, formative, and summative evaluation of growth and development of young children and for appropriate educational decisions in early childhood education settings.
Prerequisite: Undergraduate early childhood education course work or teaching experience with young children.

## ECED 577 -Learning Designs: Early Childhood Environments (3)

Study of quality learning environments and design, emphasizing the roles of children's learning, adult engagement, and theenvironment as the third teacher. Investigate s pace planning, programlayout, design theories, and aesthetic values.

Also offered for undergraduate-level credit as ECED 477 and may be taken only once for credit. . Prerequisite: Prior coursework in child development.

## ECED 578 - Constructivist Curriculum: Big Ideas in Early Childhood Education (3)

Examines the possibilities of exploring big ideas deeply over time and across the curriculumwith preschool and primary age children. Focuses on the ways that integrated curriculumand project work support children's learning
and foster the connections necessary for themto construct knowledge. Students have the opportunity to develop res ources and design classroomexperiences related to big ideas.
Also offered for undergraduate-levelcredit as ECED 478 and may be taken only once for credit. . Prerequisite: Prior coursework in child development.

## ECED 579 - Young Child as Scientist (3)

Explores developmentally appropriate science for preschool and primary age children, focusing on experimentation and problem-solving. Students experience and design activities for young children around three questions that derive fromtraditional science content: can I make it move, can I make it change, and how does it fit? In the process, students will learn more about constructivist teaching and curriculum, particularly as applied to science education.
Also offered for undergraduate-level credit as ECED 479 and may be taken only once for credit. . Prerequisite: Prior coursework in child development.

## ECED 585 - Dynamic Models of Infant/Toddler Development (3)

Provides information on typical infant and toddler mental health development and strategies for working with young children and their families within a culturally sensitive context. Includes prenatal and postnatal development, brain development as well as theories of development including attachment, resiliency, and self-regulation are presented froma cross-disciplinary perspective. Content reflects recommended practices across disciplines when working with young children and their families.

## ECED 810 - SelectedTopics (1-12)

(Credit to be arranged.)

## Ed - Education

## Ed 150 - Teaching as a Career (2)

Exploration of the challenges and privileges of teaching children and young adults in American public schools. Examines the purpose of schools and schooling, learning as a developmental process, and teaching as a skilled profession.

## Ed 199 - Special Studies (1-4)

(Credit to be arranged.)

## Ed 403 - Thesis (1-6)

(Credit to be arranged.)

Ed 407 - Seminar (1-6)
(Credit to be arranged.)

## Ed 410 - Experimental Course (1-6)

(Credit to be arranged.)

## Ed 420 - Introduction to Education and Society (4)

Explores the nature of public education in the social context of the United States. Purpose is to develop critical ways of thinking about schools as social institutions and as a means of cultural transmission and transformation.
Includes one credit (30hour) assigned practicumin public school setting.
Also offered for graduate-level credit as Ed 520 and may be taken only oncefor credit.

Ed 502 - Independent Study (1-9)
(Credit to be arranged.)

Ed 506 - Special Problems (1-8)
(Credit to be arranged.)

## Ed 507 - Seminar (1-6)

(Credit to be arranged.)

Ed 509 - Practicum of Children/Youth (1-9)
(Credit to be arranged.) Consent of instructor.

## Ed 510 - Experimental Course (1-6)

(Credit to be arranged.)

## Ed 511 - Reading/Language Arts Pre-K-12 (3)

Provides an overview of language development and general education literacy instruction fromprekindergarten to 12th grade. Age-appropriate methods for literacy instruction at each grade level are discussed and evaluated with respect to the exceptional learner.

Prerequisite: Ed 520.

## Ed 518 - Inclusive Elementary Classrooms (2)

Overview of teaching students whoexperiencedisabilities and giftedness, with specialconsideration to cultural/linguistic factors. Provides an overview of applicable laws and regulations, eligibility for special education, and the IEP process. Explores the ramifications of learning diversity for the inclusive elementary clas sroomteacher and instruction that supports all learners.
Prerequisite: Admission into the Graduate Teacher Education Program.

## Ed 519 - Inclusive Secondary Classrooms (3)

Overview of teaching students whoexperience disabilities and giftedness, with specialconsideration to cultural/linguistic factors. Provides an overview of applicable laws and regulations, eligibility for special education, and the IEP process. Explores the ramifications of learning diversity for the inclusive secondary classroom teacher and ins truction that supports all learners.

Prerequisite: Admission into the Graduate Teacher Education Program.

## Ed 520 - Introduction to Education and Society (4)

Explores the nature of public education in the social context of the United States. Purpose is to develop critical ways of thinking about schools as social institutions and as a means of culturaltransmis sion and transformation. Includes one credit (30hour) assigned practicumin public school setting.

Also offered for undergraduate-level credit as Ed 420 and may be taken only once for credit.

## Ed 525 - Student Teaching (6-15)

(Credits to be arranged.)

## Ed 530 - Introduction to Inclusion and Special Education (2)

Provides an introduction to special education and the philosophy and practices as sociated with inclusive education. Provides historical, social and legal foundations for inclusive education. Provides students with an opportunity to develop and defend a position regarding the inclusion of students with special needs in general education.

Prerequisite: Admission to the Inclusive Elementary Educators Program.

## Ed 531 - Planning and Instruction for Students with Special Needs (3)

This course examines instructional methods, knowledge, and skills needed by elementary clas sroom and special education teachers for the instruction of students with
special learning needs. Other content includes relevant federal and state policies and procedures, individual education plans, and differentiated les son plans.
Prerequisite: Admis sion to the Inclusive Elementary Educators Program.

Ed 532 - Human Development and Learning (3)
Students will develop an understanding of psychological concepts, theories, and principles and apply themto learning and instruction. Four areas of psychological research that havesignificant implications for learning will be emphasized: cognitive and metacognitive factors, motivational and affective factors, developmental and social factors, and individual differences.

Prerequisite: Admis sion to the Inclusive Elementary Educators Program.

## Ed 533 - Literacy Methods for the Inclusive Classroom: I (3)

Provides a foundation in research-based instruction for teaching literacy to early childhood/elementary students in inclusive educational settings. Provides an overview of language and literacy development for typical and atypical learners. Presents effective instructional practices for teaching and assessing emerging reading, beginning reading, primary and intermediate decoding skills, vocabulary, comprehension, and writing. Practice opportunities will be provided at the teacher candidates' field experience sites.

Prerequis ite: Admis sion to the Inclusive Elementary Educators Program.

## Ed 534 - Literacy Methods for the Inclusive Classroom (3)

This course will examine instructional methods that are effective for teaching all students to read, write, and spell. Emphasis will be placed on key processes that have been demonstrated through research to be essential for developing competency in reading, writing, and spelling for students with special learning needs.
Prerequisite: Admis sion to the Inclusive Elementary Educators Program.

Ed 535-Classroom BasedAssessment for the Inclusive Educator (2)

This course provides a theoretical framework for using as sessment to guide ins tructional decis ions. Teacher candidates will learn about formative assessment and databased decision-making. The primary focus of the course is for teacher candidates to learn to understand critical features of assessment in education and use assessment to guide instructional decisions.

Prerequisite: Admis sion to the Inclusive Elementary Educators Program.

## Ed 536 - Educational Research and Inclusive Education (3)

The goals of this course are to enable students to become intelligent consumers of educational research, assist students in the conceptualization and design of a research project, aid students in developing an understanding of the scientific process, and aid students in developing an understanding of research- and evidence-based educational practice.
Prerequisite: Admission to the Inclusive Elementary Educators Program.

Ed 537 - Professional Seminar I: Law and Ethics (1)
This course has two major focuses: educational law and policy at the federal and state level, and ethics of the teaching profession. The course is also a forumfor reflection and discussion of field experience.

Prerequisite: Admis sion to the Inclusive Elementary Educators Program.

## Ed 538 - Professional Seminar II: Philos ophy (1)

This course provides a forumfor discussion and reflection of the field experience, leads to the creation of a teaching philosophy statement and provides guidance for the completion of the work sample.
Prerequisite: Admission to the Inclusive Elementary Educators Program.

## Ed 539 - Professional Seminar III: Reflection and Job Search (1)

This course serves multiple purposes. It serves as a vehicle for discussion and reflection of field experiences. Seminars will focus on preparing materials for the job search. Some seminartime will be used for student advising re licensure and graduation.

Prerequisite: Admission to the Inclusive Elementary Educators Program.

## Ed 540 - Functional Assessment for the Inclusive Eementary Educator (3)

Develops philosophical and social foundations for services to individuals with significant and multiple dis abilities, early childhood through elementary. Emphasizes ecological and functional as sessments strategies for life skills, communication, social, motor, and functional academic domains. Strategies for including students with significant and multiple disabilities in system-wide, standards-based assessment are addressed.

Prerequisite: Admission to the Inclusive Elementary Educators Program.

## Ed 541 - Functional Curriculum for the Inclusive Eementary Educator (3)

Course applies knowledge and skills for functional as sessment and applied behavior analy sis in the design and implementation of an individualized, functional curriculum for students with significant and multiple dis abilities, early childhood through elementary.

Prerequis ite: Admis sion to the Inclusive Elementary Educators Program.

## Ed 542 - Collaboration for the Inclusive Elementary Educator (2)

This course covers broadly the context, process, and content of collaboration and teamwork in the schools with a specific focus on the inclusion of students with disabilities and special needs in generaleducation clas srooms. Other topics includeco-teaching, problem solving, and conflict resolution.
Prerequisite: Admis sion to the Inclusive Elementary Educators Program.

## Ed 543 - Specialized Techniques for the Inclusive

 Eementary Educator (1)Presents Information and skills necessary for meeting the specialized support needs of students with significant disabilities. Course is designed to assist theeducator in becoming an effective member of a trans-disciplinary team that serves students with routine and emergency medical and physical needs and is taught froman inclusive perspective.
Prerequisite: Admis sion to the Inclusive Elementary Educators Program.

## Ed 580 - Adolescent Learners in Inclusive Settings (2)

Focuses on principles of human learning and related practices for teaching in inclusive classrooms in the middle/high school setting. The psychology of learning in a school setting includes both individual and group generalizations, with an emphasis on the developmental tasks of adolescence. Examines the roles and functions of teachers as facilitators of learning, and as decision makers concerning pupil needs and achievement in inclusive middle/high school settings.

Prerequisite: admis sion to SDEP. .

## Ed 581 - Inclusive Classroom Researcher (2)

Frames research questions concerning the principles, practices, promises, and problems of inclusive classrooms. Explores the philosophical and practical benefits of inclusive practices. Teacher networks, literature reviews and research design will provide the groundwork for collecting datathroughout the program.
Prerequisite: admis sion to SDEP.

## Ed 582-Collaborative Teaming and the Special Education Process (4)

Introduction to special education law and processes that prepares future teachers to actively participate, plan and facilitate IEP and school teammeetings. Includes an overview of state and federal laws/regulations, the IEP process and special education service delivery systems. Explores collaborative teaming processes in middle and secondary school settings.
Prerequisite: admission to SDEP program. .

## Ed 583 - Study Skills and Learning Strategies (2)

Examines typical secondary class demands and instructional methods to enable students with dis abilities and other low achievers to become independent learners. Emphas is on contentenhancement tools to increase acces sibility of content as well as instructional methods for teaching study skills and learning strategies. Includes models and methods for infusing this instruction into the secondary curriculum.

Prerequisite: admis sion to SDEP program. .

## Ed 584 - Advocacy and Transition Planning (2)

Focuses on student support and advocacy, school-family collaboration and transition planning. Concepts and curriculumrelated to person-centered planning and teaching self-determination skills addressed. Examines collaborative skills needed to empower students, families, communities, service agencies, and other support systems and facilitate inclusive practices in secondary settings.

Prerequisite: admission to SDEP program. .

## Ed 585 - Instructional Planning for Inclusive Classrooms (3)

Addresses principles and skills for organization and presentation of grades 6-12 inclusive standards-based instruction. Includes: student needs analysis, universal design for learning, differentiation, and assistive technology for effectively teaching a diverse group of adolescent learners.
Prerequisite: admission to SDEP program.

## Ed 586-Collaborative Teaching (2)

Students will study practices and techniques thatenhance instructional collaboration and consultation among general education and specialeducation teaching professionals. Models and methods for supporting students with dis abilities in middle and secondary school general education classrooms will be explored.

Prerequisite: Admission to SDEP and (Advocacy and Planning with Secondary Students, Collaborative Teaming). .

## Ed 587 - Inclusive Educational Research and Leadership (2)

Critically reviews the principles, practices, promises, and problems of inclusiveeducation. Teacher candidate work samples, compilation and analysis of action research data, and educational leadership project provide culminating experiences blending the dual perspectives of general and special education and benefits of inclusive practices in teaching content to all students.
Prerequisite: admis sion to SDEP program. .
Ed 607 - Seminar (1-9)
(Credit to be arranged.)

## Ed 610 - Experimental Course (1-4)

(Credit to be arranged.)

## Ed 620 - Doctoral Studies Proseminar (1-4)

This three course four-credit sequence is required for all doctoral students and is taken during the first year of doctoral study, beginning with two credits in the fall and one credit each in winter and spring terms. The course is des igned to extend and deepen thinking about education, "educational leadership" and inquiry through shared readings, interaction with faculty and local educational leaders, and critical reflective writing and conversation. Students are expected to initiate and maintain a learning and a professional portfolio and by the end of spring term to develop and present a formal paper that examines an educational is sue using frameworks and concepts fromEd 630, 640 and 650, which are also taken during their first year. This paper may serve as an initial draft of the doctoral core examination paper.

Prerequis ite: admis sion to doctoral programor permis sion of instructor.

## Ed 630 - Principles and Practices of Learning (4)

The study of theories of learning in a variety of educational contexts: clas srooms for youth and for adults, counseling, and non-school settings. Study of the narratives of teaching and learning to analyze the enactment of theory and to examine the variety of ways to research learning.
Prerequis ite: admis sion to doctoral programor permis sion of instructor.

## Ed 640-Organizational and Leadership Theory and Research in Education (4)

Organizational and leadership theory and research in education informing the study, practice, and improvement of educational policy and practice in PreK-12 school, higher education, and non-school contexts; emphasis on
emergent perspectives and their significance for theory, research, and practice.
Prerequisite: admission to doctoral programor permis sion of instructor.

## Ed 650 - Educational Policy and Politics (4)

The study of how policy is proposed, adopted, implemented, and changed in educational org anizations. Special emphasis on the political process and how it influences the policy cycle.
Prerequisite: admission to doctoral programor permission of instructor.

## Ed 660 - Foundations of Research Paradigms and Methods (4)

An introduction to research paradigms and research methodologies that are useful to better understand and/or address problems of educational practice. Provides doctoralstudents with knowledge of basic processes of inquiry so they are able to begin designing individual research projects.

Prerequisite: admission to doctoral programand/or EPFA 511 or 515 or permission of instructor.

## Ed 661 - Qualitative Research Methods in Education (4)

Introduces qualitative research methods of data collection and analysis in education. Reviews theoretical foundations, field research problems, and qualitative data collection and analys is methods including participant observation, depth interviewing, and development of grounded theory.
Prerequisite: admission to doctoral programor permission of instructor.

## Ed 662 - Quantitative Research Methods in Education

 (4)Introduces quantitative research methods of data collection and analysis in education. Reviews theoretical foundations, applications and design issues of methods such as survey, correlational and experimental research. Also, introduces how to conduct a statistical data analysis and use such methods as correlation, t-test, analy sis of variance and chisquare.
Prerequisite: admis sion to doctoral programor permission of instructor.

## Ed 700 - In-service Education (1-6)

(Credit to be arranged.) Credits are for district in-service and are not counted toward a graduate degreeor specialist license.

## EE-Electrical Engineering

## EE 347 - Power Systems I (4)

Fundamentals of electrical power systems, particularly non-rotating three-ph ase power systems. Phasor representation. Compleximpedance. Real, reactive, apparent power. Power factor. Non-sinusoidal representation: power quality, THD. Power factor, resonance, PF correction. Power Transformers. ABCD representation of two-port transmission networks. Power systems representation: single-line diagrams, per-unit representation. Power flow analysis. Weekly Lab. This is the first course in a sequence of two: EE 347, EE 348 and must be taken in sequence.
Prerequisite: ECE 223 (with a grade of C or better) or instructor approval. Corequisite: EE 347L.

## EE 347L-Lab for ECE 347 (0)

Lab for ECE 347.
Corequisite: EE 347.

## EE 348 - Power Systems II (4)

Fundamentals of electrical power systems, particularly rotating three-phase machines. Electromechanical machine components: rotor, stator, poles. Rotating magnetic fields. Fundamental rotational mechanics. Three-phase(induction and synchronous) and split-phase AC motors and generators. DC machines: shunt, series, compound and brushless. Motor and generator controls. Weekly Lab. This is the second course in a sequence of two: EE 347, EE 348 and must be taken in sequence.
Prerequisite: EE 347 (with a grade of C or better). Corequisite: EE 348L.

## EE 348L - Power Systems II Lab (0)

Lab for Power Systems II.
Corequisite: EE 348.

## EE 430 - Analytical Methods for Power Systems (4)

Power systems modeling. Admittance matrixes. Load flow computational methods; Gauss-Seidel, Newton-Raphson, DC, fast-decoupled power flow. Sparsity techniques. Optimal power flow alg orithms. Sy mmetrical components, sequence networks. Symmetric, unsymmetric faults. Space vector transformations. Transientoperation of transmission lines. Voltage, frequency stability. State estimation. Trans ient stability. Power systemanalysis emphasizing non-dis patchable resources.
Also offered for graduate-level credit as EE 530 and may be taken only once for credit. . Prerequisite: EE 347 (with a grade of C or better) or instructor permission.

## EE 431 - Power Systems Protection (4)

Relaying concepts, per unit calculations \& symmetrical components, phasors, polarity and direction sensing, current/voltage transformers, protection fundamentals \& basic design principles, system grounding principles, device protection, directional comparison, blocking \& blocking pilot protection, line differential \& phase comparis on pilot protection, out of step tripping and blocking. Weekly Lab.
Also offered for graduate-level credit as EE 531 and may be taken only once forcredit. . Prerequisite: EE 430 (with a grade of C or better) or instructor permission. Corequisite: EE 431L.

## EE 431L - Lab for EE 431 (0)

Lab for EE 431.
Corequisite: EE 431.

## EE 432 - Hectrical Machine Analysis and Design (4)

The principals of magnetostatic and quasi-static analysis will be applied to study different classes of electromechanical devices. Reluctance, induction, permanent magnet and wound rotor synchronous machines will be analyzed using magnetic circuit and harmonic analys is techniques. Electrical machines in wind turbines and in automotive traction motors will be discussed.
Also offered for graduate-level credit as EE 532 and may be taken only once for credit. Prerequisite: EE 348, ECE
317 and ECE 331 (with a grade of C or better) or instructor permission.

## EE 510 -SelectedTopics (0-6)

(Credit to be arranged.)

## EE 513 - Introductory Image Processing (4)

Two-dimens ional systems, image perception, image digitization (s ampling and quantization), image transforms (Fourier, Cosine, K-L trans forms), image enhancement (histogramequalization, filtering, spatial operation).

## EE 514 - Advanced Image Processing (4)

Introduction to randomfields, image repres entation by stochastic models, image res toration (Wiener and Kalman filtering), image coding and compression predictive and transformcoding, vector quantization).
Prerequisite: EE 513.

## EE 515 - Computer Vision (4)

Image detection and regis tration, image analy sis (texture extraction, edge detection, segmentation), image reconstruction (radon transform, Fourier reconstruction),
stereo imaging and motion analysis, pattern recognition (recognition, clas sification and clustering).

## EE 516 -Mathematical Foundations of Machine Learning (4)

The goal of this course is to move fromfamiliarity to fluency with the use of linear algebra to solve problems in machine learning and signal processing. Topics covered include least squares, the singular value decomposition, eigenvalue decomposition, subspace methods, and optimization methods such as stochastic gradient descent, momentummethods, ADMM, and iteratively reweighted least squares. Programming experience in a high-level language (Matlab or Python) and familiarity with calculus is required.

Prerequisite: Graduate standing or instructor permis sion.

## EE 517 -Instrumentation and Sensing (4)

Introduction to instrumentation and sensing focused on low-cost, low-power short and long range wireless sensing and monitoring techniques. Topics include small-signal electronics for interconnecting deployable sensors to analog and digital signal processing hardware, system noise floor and dy namic range, and practical implementation of wireless systems with long battery life.
Prerequisite: Graduate standing or permis sion of instructor.

## EE 518 - Machine Learning Theory and Algorithms (4)

The goal of this course is to provide a thorough understanding of the fundamental methodologies and algorithms used in machine learning. Students will learn to understand, implement, and innovate on algorithms for common tasks such as classification, regression, clustering, and dimensionality reduction. Topics covered include linear and nonlinear regression, bias-variance tradeoff, ensemble methods, support vector machines, K-means, hierarchical clustering, and Gaussian mixture models.

Prerequisite: EE 516 or Instructor Permis sion.

## EE 519 -Deep Learning Theory and Fundamentals (4)

Provides an introduction to the theory and practice of deep learning, with an emphas is on deep neural network-based approaches. Topics covered include theoretical principles of learning, including the VC-dimension and model selection, and how thesecan be used to guide the design and deployment of neural networks. State-of-the-art approaches to current problems are also covered. Programming experience in a high-level language (Matlab or Python) and familiarity with calculus is required.
Prerequisite: EE 516 or Instructor Permis sion.

## EE 520 - Random Processes (4)

Review of probability, randomvariables, and expectation followed by a study of the principles and properties of randomsequences and randomprocesses. Topics include randomvectors, fundamentals of estimation, modeling randomsequences with linear systems, stationarity, Markov randomsequences, and common randomprocess models.
Prerequisite: Stat 351 and ECE 316, graduate standing or permis sion of instructor.

## EE 522 -Discrete Time Processing (4)

Discrete time signals and systems, z-transform, sampling of continuous-time signals, transformanalysis of linear time-in variant systems, filter design, and Fourier analysis of signals.

## EE 523 -Estimation and Detection (4)

Theoretical and practical approaches to estimation and detection including both classical estimation techniques such as maximum likelihood and best linear unbiased estimation and Bayesian estimation techniques. Hypothesis testing, composite hypothesis testing, non-Gaussian noise, model change detection. Discussion of the advantages, limitations, and tradeoffs for each of these methods.
Prerequisite: EE 520.

## EE 525 -Spectral Estimation (4)

Unified introduction to theory, implementation, and applications of statistical signal processing methods. Focus on randomsignal modeling, characterization of stochastic signals and systems, and nonparametric spectral estimation. Designed to give a solid foundation in the underlying theory balanced with discussion of practical advantages and limitations of nonparametric spectral estimation methods.
Prerequisite: EE 522.

## EE 526 - Adaptive Filters (4)

Unified introduction to the theory, implementation, and application of statistical signal processing methods. Focus on optimumlinear filters, least square filters, adaptive filters, the Kalman filter, signal modeling, and parametric spectral estimation. Designed to give a solid foundation in the underlying theory balanced with examples of practical applications and limitations.

## Prerequisite: EE 522.

## EE 527 -Sens or Array Processing (4)

Overview of applications in acoustics and electromagnetism that benefit fromsensor array processing. Topics include array geometry design, performance measures, source tracking, passive and active
approaches, wave propagation modeling, beamforming, noise modeling, and adaptive methods.
Prerequisite: ECE 332 orequivalent.

## EE 528 -State Space Tracking (4)

Modern approaches to estimating the state of linear and nonlinear systems. Topics include linear systems theory, the Kalman filter, the extended Kalman filter, unscented Kalman filter, and the particle filter. Designed to give a solid introduction and fundamental understanding of the advantages, limitations, and tradeoffs for each of these methods.
Prerequisite:EE 522.

## EE 529 -Signal Processing Practicum (4)

Topics include scholarship skills, framing of signal processing problems, and algorithm verification. Students design, implement, and verify an engineering solution for a signal processing application. This course is intended to be taken after students have completed most of their other graduate coursework in signal processing.
Prerequisite: EE 519, EE 522, and permis sion of instructor.

## EE 530 - Analytical Methods for Power Systems (4)

Power systems modeling. Admittance matrixes. Load flow computational methods; Gauss-Seidel, Newton-Raphson, DC, fast-decoupled power flow. Sparsity techniques. Optimal power flow algorithms. Symmetrical components, sequence networks. Symmetric, unsymmetric faults. Space vector transformations. Transient operation of transmission lines. Voltage, frequency stability. Stateestimation.
Transient stability. Power systemanaly sis emphasizing non-dis patchable resources.
Also offered for undergraduate-level credit as EE430 and may be taken only once for credit. . Prerequisite: EE 347 or instructor permis sion.

## EE 531 - Power Systems Protection (4)

Relaying concepts, per unit calculations \& symmetrical components, phasors, polarity and direction sensing, current/voltage transformers, protection fundamentals \& basic design principles, systemgrounding principles, device protection, directional comparison, blocking \& blocking pilot protection, line differential \& phase comparison pilot protection, out of step tripping and blocking. Weekly Lab.
Also offered for undergraduate-level credit as EE431 and may be taken only once for credit.. Prerequisite: EE 430/EE 530 or instructor permission. Corequisite: EE 531L.

## EE 531L-Power System Protection Lab (0)

Lab for Power SystemProtection.
Corequisite: EE 531.

## EE 532 - Electrical Machine Analysis and Design (4)

The principals of magnetostatic and quasi-static analysis will be applied to study different classes of electromechanical devices. Reluctance, induction, permanent magnet and wound rotor synchronous machines will be analyzed using magnetic circuit and harmonic analys is techniques. Electrical machines in wind turbines and in automotive traction motors will be discussed.
Also offered for undergraduate-levelcredit as EE432 and may be taken only once for credit. Prerequisite: EE 348, ECE 317, and ECE 331 or instructor permission.

## EE 534 - Power Operations Fundamentals I (4)

Power systemoperations theory and practice; fundamental concepts and applications. Balancing authority operations concepts concerning regulation and applied regulatory constraints, power operations trading markets, s mart-grid systems, transmission and generation components, and cybersecurity.
Prerequisite: EE 347 or instructor permis sion.

## EE 535 - Power Operations Fundamentals II (4)

Power systemoperations theory and practice; adv anced concepts and applications. Emphas is on understanding the electric industry as a complexs ystem; operations concepts for balancing authority utilities; regulatory constraints, interoperability and impacts on operations; project management of s mart-grid systems; design of programmatic, dis tribution and utility-scale renewable components; utility cyber security.
Prerequisite: EE 534 or instructor permis sion.

## EE 536 - Power SystemStability (4)

Electromechanical dynamic modeling, analysis, calculations related to transient and steady-statestability within electric power systems. Factors affecting power systemtransient stability: load, generation, network topology, protection clearing times, reclosing. Machine models. The swing equation. Equal area criterion. dq0 modeling of synchronous machines. P-f, Q-V loops for synchronous machine control.
Prerequisite: ECE 431 or EE 531 or instructor permis sion.

## EE 537 - Advanced Power Systems Protection (4)

The second course protection for students who have taken a previous class or have substantial experience in protective relaying. Emphasis: analysis of principles and application of microprocessor-based relays (digitalrelays) to protection of high-voltage transmission lines, power transformers, power generators, high-voltage substation equipment; wide-area approach to power systems protection.
Prerequisite: ECE 431 or EE 531 or instructor permis sion.

## EE 538 - Dynamics and Control of AC Drives (4)

Focus on studying the theory behind the control of ac drive systems. Topics studied will include: coupled circuit modeling of ac machines, dynamic modeling of induction machines, power converter and converter modeling, the simulation of electric machines and drives, electric drive systemcontrol, steady state analysis with non-conventional sources, small signal dynamic res ponse and doubly salient electric machines.
Prerequisite: EE 432/EE 532.

## EE 539 - Design of Electrical Machines (4)

Modern methods used by engineers to design electromagnetic devices, specifically rotary machines will be presented. Topics covered include finite element analys is modeling using electromagnetic field theory. Magnetic circuit modeling of electric machines, analysis of electrical machines using winding functions. Emphasis will be placed on permanent magnet and induction machine design.
Prerequisite: EE 432/EE 532.

## ELP - Educational Ldrshp \& Policy <br> ELP 199 - Special Studies (1-4)

(Credit to be arranged.)

## ELP 318U- Introduction to Educational Leadership in Public Schools (4)

Familiarizes students with the theoretical development, empirical studies, policies, and decision making processes of public schooling. Structured around a number of themes, including instructional leadership, moral leadership, democratic leadership, facilitative leadership, curricular leadership, constructivist leadership, and ethical leadership in education. Students explore the operational meaning of these perspectives through a combination of experiences including clas s discussions, case studies, guest speakers, and interviews and observations of school leaders at work. Course includes an additional, concurrent 30 -hour minimum field project requirement.

## ELP 324U- Introduction to Spiritual Leadership(4)

An introductory exploration into spirituality and its connection to leadership. The meaning of engaged spiritual leadership will be examined through such themes as: identity, paradox, interconnectedness, and sustainability. A community-based field project offers an opportunity to examine leadership is sues through the lens of spirituality.

## ELP 348U - Introduction to Global Political Ecology (4)

In order to grasp the emerging discipline of political ecology, engages in discussions regarding the following: impact of globalization on human and non-human communities; relationship between poverty and environmental degradation; dis tribution of resource use and commodification in the globalNorth and global South, and the relationship of these is sues in our pers onal lives.

ELP 349U- Gandhi, Zapata and New Agrarianism (4)
This course explores the emergence of "new agrarianism" by examining the social, political, economic and ecological implications of agriculture, and the revolutionary efforts of Zapata and Gandhi against the abuses of modern industrial practices. Recentphilosophical and ecological models of new agrarian is mare introduced, with emphasis on local food systems.

## ELP 350 U- Introduction to Leadership for Sustainability (4)

Multi-media seminar and discussion course reviews, analyzes and critiques the history, politics and rhetoric of sustainability. Four key themes are covered: is sues surrounding the Johannesburg Summit 2002; growing conservation economy in the Pacific Northwest; the issue of indigenous cultures and sustainability, and a critical review of the emergence and future of transnational civil society. Examines the very idea of local, regional, and global and discusses the role social movement networks, information society, and globalization play in meaningful social change and leadership.

## ELP 351 U- Gender and Education (4)

Explores the significanceof gender in educational work. The focus will be on the history of gender arrangements in educational org anizations and the formation of gender roles in contemporary American society, particularly in the family, schools, and the economy. Students will examine differential socialization of males and females, on going practices in educational organizations that are genderrelated and/or gender biased and the convergence of gender, race, and class in educational organizations. This course is cross-listed as WS 455, may only be taken once for credit. ELP 555 includes an additional, concurrent 30 hour minimum field project requirement.

## ELP 356U- The Urban School and "at Risk" Status (4)

Draws upon theory, research, and practice for the examination of the conditions of being "at-risk" in urban schools. Explores the family, community, and school
environments and their relationships in the hindrance of development of children and youth leading to their "atrisk" status. ELP 556 includes an additional, concurrent 30 hour minimum field project requirement.

## ELP 362U - Introduction to School and Community Relations (4)

Majoremphas is will be on exploring the ways schools interact with parents, citizens and special interest groups that lead to building a diverse community. Course includes an additional, concurrent 30-hojur minimum field project requirement.

## ELP 399 - Special Studies (1-4)

(Credit to be arranged.)

## ELP 401 - Research (1-6)

(Credit to be arranged.)

## ELP 402 - Independent Study (1-12)

(Credit to be arranged.)

ELP 403 - Thesis (1-6)
(Credit to be arranged.)

## ELP 404 - Cooperative Education/Internship (1-12)

(Credit to be arranged.)

## ELP 405 - Reading and Conference (1-6)

(Credit to be arranged.)

## ELP 406 - Special Problems (1-12)

(Credits to be arranged.)

ELP 407 - Seminar (1-6)
(Credit to be arranged.)

## ELP 408 - Workshop(1-6)

(Credit to be arranged.)

## ELP 409 - Practicum(1-9)

(Credit to be arranged.)

## ELP 410 - Experimental Course (1-6)

(Credit to be arranged.)

## ELP 418 - Permaculture \& Whole Systems Design: Principles and Practices for Sustainable Systems (4)

Permaculture is the study and observation of ecosystems, integrated with insights and practices of diverse indigenous peoples, combined to create an ethical whole systems design process. This course explores permaculture and whole systems design principles in order to apply these concepts to the designing of sustainable systems. Learners will gain a firm understanding of permaculture principles and an ecological design process, and will apply this understanding to create holistic, just, and regenerative, educational designs.
Also offered for graduate-level credit as ELP 518 and may be taken only once for credit. Prerequis ite: Upper-division standing.

## ELP 429 - Principles of Training and Development (3)

Examination of the principles of training and development with emphas is on applying adult learning theory to the training function. Es sential principles include those related to developing training objectives, selecting training methods and resources, sequencing the learning experiences, andevaluating the training. Designed for trainers froma variety of work settings with a strong background in a content area who have little background in adult learning theory and its application to training and development practices.
Also offered for graduate-level credit as ELP 529 and may be taken only once for credit.

## ELP 430 - Course Design andEvaluation (4)

Examination of the field of instructional programdesign for adult learners within the training and development field, in educational and non-educational org anizational settings. Focus on learning to design and manage instructional activities in response to training needs and skills analyses. Students are required to select and use an appropriate design model, design a preliminary needs as sessment, develop programgoals and learning objectives, develop an instructional plan, develop a plan to as sess student learning and evaluate the program, and critically review the design document. Major emphasis given to developing the instructional design document that demonstrates a student's ability to align and integrate effectively all aspects of the design process and to
incorporate adult learning theory. Expected preparation: ELP 429/529.

Also offered for graduate-level credit as ELP 530 and may be taken only once for credit. .

## ELP 431 - Contemporary Issues in Training and Development (3)

Building on competencies developed during previous courses in the training anddevelopment series, provides a culminating experience to the series. Provides an opportunity for students to examine national and local trends in training and organizational development and to prepare for ongoing professional growth in the context of contemporary is sues in the field. Expected preparation: ELP 429/529 plus two other courses in the series.
Also offered for graduate-level credit as ELP 531 and may be taken only once for credit. .

## ELP 432 - Training Methods (3)

Focuses on instructional strategies and effective delivery of training programs necessary forenhancing adult learning and professional development. Students will examine individual learning preferences and multiple types of active pedagogy for increasing transfer of learning. In addition, various techniques and tools for linking learning outcomes with organizational goals will be addressed.
Also offered for graduate-level credit as ELP 532 and may be taken only once for credit. Prerequis ite: ELP 429/529.

## ELP 434 - Leadership of the Training Function (3)

Focuses upon research-based, practical approaches for leading, managing, and evaluating the training and development function in organizations. It explores the role of training and development in achieving individual and org anizational goals, as well as strategies and resources used in effective personnel development. Students analyze how to: develop, manage and ev aluate the training function; identify strategies and resources for effective training management; and diagnose how the organization's culture and needs affect the selection and success of training management efforts.
Also offered for graduate-level credit as ELP 534 and may be taken only once fror credit. . Prerequisite: ELP 429/529.

## ELP 435- Organization Transformation through Training and Development (3)

Designed for managers of the training and development function in organizations, this course focuses on the role of training and development in organization transformation, improvement, and change. The course provides opportunities to bring real workplace examples into the classroomand to apply organization development and systems theory in the development strategies for
organization improvement through the training and development function.

Also offered for graduate-level credit as ELP 535 and may be taken only once fror credit. . Prerequisite: ELP 429/529.

## ELP 439 - Developing Training Materials (3)

Focus on the theories, knowledge and skills necessary to plan, develop and use effective participant and presentation training materials that enhance adult learning in training and development settings. Study the linkage of instructional design, adult learning representational systems and graphic design theories and how materials increase transfer of learning. In addition, examine writing is sues relevant to effective communication, the selection and use of production methods, and project plans for training materials.
Also offered for graduate-level credit as ELP 539 and may be taken only once for credit.

## ELP 440 - Urban Farm Education: Leveraging Policy and Research to Cultivate Garden-Based Education in Practice (4)

Students explore the policy and research context surrounding garden-based education in schools and communities with a focus on instructional design and as sessment. As a learning community, students examine how policies and educational practices can pose barriers or potential leverage points for systemic change, and develop and teach integ rated garden-based curriculum.

Also offered for graduate-level credit as ELP 540 and may be taken only once forcredit. . Prerequisite: Upperdivision standing.

## ELP 444 - eLearning Instructional Design (3)

Design of a self-paced Learning simulation with appropriate ins tructional methods, user interface designs, media choices, and levels of interactivity and engagement. Expected preparation: ELP 484 or ELP 429.

Also offered for graduate-level credit as ELP 544 and may be taken only once for credit. . Prerequisite: Upperdivision standing.

## ELP 445 - Developing eLearning (4)

Examination of development methodologies/processes, principles of taskidentification, risk mitigation, technical architecture, creative tools, and project management strategies used in developing eLearning. Application of learning theory to the development of eLearning. Expected preparation: ELP 429 and ELP 430.
Also offered for graduate-level credit as ELP 545 and may be taken only oncefor credit. . Prerequisite: Upperdivision standing. .

## ELP 446 - Early Childhood Education: Relationships with Home and Society (3)

Considers the sociology of families and communities in the development of cooperative relationships with programs for young children.
Also offered for graduate-level credit as ELP 546 and may be taken only once for credit. . Prerequisite: Undergraduate early childhoodeducation coursework or teaching experience with young children..

## ELP 447 - Administration of Early Childhood Programs (3)

Examines theory and practiceinforming the adminis tration/leadership of early childhood programs to include: 1) organizational configurations, 2) leadership and the dynamics of the work group, 3) developmentally appropriate curriculum, 4) interaction with families of young children, and 5) significance of poverty, race, and gender for such programs.
Also offered for graduate-level credit as ELP 547 and may be taken only once for credit. . Prerequisite: child and family studies major or admission to an education graduate program.

## ELP 451 - Social Foundations of Education (4)

Study of sociological theories that illuminate the effects of education on individuals and society. Problem areas in race, class, and gender are explored in the process of examining theories of socialization, certification, allocation, and legitimation and their application to historical and current educational situations.

Also offered for graduate-level credit as ELP 551 and may be taken only oncefor credit.

## ELP 452 - History of Education (3)

A general review of the growth and development of education in relation to the civilization of the times; emphas is is placed upon the development of educational theories at various points in history.

Also offered for graduate-level credit as ELP 552 and may be taken only once for credit.

## ELP 453 - History of American Education (4)

The historical development of the Americaneducational system, fromEuropean backgrounds and colonial beginnings to the present time.
Also offered for graduate-level credit as ELP 553 and may be taken only once for credit.

## ELP 454 - Philosophy of Education (4)

Study and comparison of the philosophical bases of educational ideas and of the educational implications of
philosophicalthought. ELP 554 includes an additional, concurrent 30 hour minimum field project requirement.

Also offered for graduate-level credit as ELP 554 and may be taken only once for credit. .

## ELP 457 - Cultural Pluralism and Urban Education (4)

This course is designed to explore the process of education policy development and implementation in culturally diverse, urban en vironments. The course is organized around several cultural pluralis mperspectives; among the topics to be explored are the is sues of socialization of the child, governmental operations, educational adminis tration, teacher preparation and curriculum design. ELP 557 includes an additional, concurrent 30 hour minimum field project requirement.

Also offered for graduate-level credit as ELP 557 and may be taken only once for credit. .

## ELP 465 - ELL School Community Relations (3)

Learn how to work with families to overcome barriers to setting-up support systems in and out of school. Access appropriate community res ources that can be critical for ensuring classroom success with ELL students. Gain understanding about other cultures' orientations to education and school. Learn strategies to build bridges between home, school, and the community.
Also offered for graduate-level credit as ELP 565 and may be taken only oncefor credit.

## ELP 466 - Impact of Language and Culture in the Classroom (3)

Learn the importance of intercultural communication in working with children from a wide range of cultures in today's classroom. Survey the cultural, linguistic, educational, and ethical is sues present in all class rooms today. Study the sociological and language is sues and immigration history. Learn how to identify and appreciate cultural factors that affect social adjustment and learning.

Also offered for graduate-level credit as ELP 566 and may be taken only once for creditl.

## ELP 467 - ESL/Bilingual ProgramDesign and Models (3)

Exemplary schools provide second language learners with a rich intellectual diet, not a remedial or bas ic skills curriculum. They expect all students to achievehigh standards in literacy and other academic areas. Learn how these schools combine their understandings and apply the knowledge of local, state, and federallaws and policies along with pedagogical considerations to create effective programs. Participants will examine a variety of local, regional, and national programmodels for ESL and Bilingual ins truction. This will create opportunities to develop expertise in assessing the critical components of programs serving pre-school through adults.

Also offered for graduate-level credit as ELP 567 and may be taken only once for credit.

## ELP 484 - Strategies for eLearning (3)

Best practices in eLearning and pedagogical is sues related to design, development, and delivery. Application of research in learning and cognition to eLearning for design, analys is and problemsolving.

Also offered for graduate-level credit as ELP 584 and may be taken only once for credit. Prerequis ite: Upper-division standing.

## ELP 501 - Research (1-9)

(Credit to be arranged.)

## ELP 502 - Independent Study (1-9)

(Credit to be arranged.)

## ELP 503 - Thesis (1-9)

(Credit to be arranged.)

## ELP 504 - Cooperative Education/Internship (1-9)

(Credit to be arranged.)

## ELP 505 - Reading and Conference (1-6)

(Credit to be arranged.)

## ELP 506 - Special Problems (1-6)

See department for course description (Credit to be arranged.)

## ELP 507 - Seminar (1-6)

(Credit to be arranged.)

## ELP 508 - Workshop(1-6)

(Credit to be arranged.)

ELP 509 - Practicum(0-9)
(Credit to be arranged.)

## ELP 510 - SelectedStudies (1-6)

(Credit to be arranged.)

## ELP 511 - Principles of Educational Research and Data Analysis I(4)

Research paradigm; measurement and test characteristics; planning and evaluation; library resources; identifying research problems; planning research; types of research; research designs, central tendency, variability and relationships; sampling, sampling error, and hypothesis testing; crossbreaks; one, two, and multiple group, and multiple independent variable designs; computer applications; information systems. This is the first course in a sequence of two: ELP 511 and ELP 512.
Prerequisite: graduatestanding. .

## ELP 512 - Principles of Educational Research and Data Analysis II (4)

Research paradigm; measurement and test characteristics; planning andevaluation; library resources; identifying research problems; planning research; types of research; research designs, central tendency, variability and relationships; sampling, sampling error, and hypothesis testing; crossbreaks; one, two, and multiple group, and multiple independent variable designs; computer applications; information systems. This is the second course in a sequenceof two: ELP 511 and ELP 512.

Prerequisite: graduate standing. .

## ELP 513 - Advanced Research Designs andData Analysis in Education (4)

Designs for multiple independent variables; equating designs for multigroups; designs for multiple dependent variables; follow-up procedures for multiple dependent variable designs; selected data collection methods, including questionnaires, interviews, observation, sociometry, and objective tests and scales; computer application in the use of selected designs.
Prerequisite: ELP 512.
ELP 514 - Educational Measurement and Assessment (4)

Minimum competency, norm-referenced, and criterionreferenced tests; classroomstudent assessment; characteristics and levels of meas urement; reliability; validity; interpreting test scores; standardized tests; using performance standards; planning and constructing clas srooms election; supply and performance tests; portfolio as sessment; evaluating test items.

Prerequisite: graduate standing. .

## ELP 515 - Program Evaluation (4)

An examination of evaluation theory and approaches and their applications in educational settings. Emphasis is given to programevaluation and to understanding how the usefulness of evaluation results may be increased.

Prerequisite: graduatestanding. .

## ELP 516-Collaborative Ethnographic Research Methods (4)

Explores if and how a participatory and collaborative form of research will foster knowledgedemocracy, and give ownership to those whose knowledge it is. Methodologies covered are: different genres of qualitative methods, community-based planning and research, participatory action-research, Gaian participatory science, clas sical ethnography, auto-ethnography, ethnographic performance, life histories, feminist methodologies, and "dialogue circles."

Also offered as ELP 616 and may be taken only once for credit.

## ELP 517 - Ecological and Cultural Foundations of Learning (4)

Explores what constitutes ecological and cultural ways of knowing and how teaching and learning can be informed by ecological principles. As we question dominanttaken-for-granted paradigms, we will explore modalities of pedagogy that are relational, co-created, place-based, participatory, experiential, critical, contemplative, multis ensory, transformative, storied, embodied, and more. Students create a teaching philosophy that reflects an understanding of ecological principles and sustainability pedagogy, and design and facilitate an effective teaching experience to apply their understanding.

## ELP 518 - Permaculture \& Whole Systems Design: Principles andPractices for Sustainable Systems (4)

Permaculture is the study and observation of ecosystems, integrated with insights and practices of diverse indigenous peoples, combined to create an ethical whole systems design process. This course explores permaculture and whole systems design principles in order to apply these concepts to the designing of sustainable systems. Learners will gain a firm understanding of permaculture principles and an ecological design process, and will apply this understanding to create holistic, just, and regenerative, educational designs.

Also offered for undergraduate-level credit as ELP 418 and may be taken only once for credit.

## ELP 519 - Sustainability Education (4)

Foregrounding urgency of climate change, this course explores theories and innovative practices of sustainability education in formal and informal settings. Participants critically assess earlier traditions such as nature education, environmental education, and outdoor education, as well as explore the intersections of indigenous, ecofeminist, and ecojustice perspectives on sustainability. Drawing upon globalexamples, the course promotes development of
practitioners and scholars with proficiency, solutions-based knowledge, and tools to advance sustainability education in their own life/profes sional contexts.

## ELP 520 - Developmental Perspectives on Adult Learning (4)

Explores professional applications of adult development theory and research to facilitating adult learning in a wide variety of contexts, including formal educational and training programs as well as general environments such as learning organizations. Course includes an additional, concurrent 30 hour minimum field project requirement.
Prerequisite: admission to a graduate program. .

## ELP 521 - Adult Learning and Motivation (4)

An examination of the complexinteraction among adult development, motivation, and learning. Attention is focused on the intra- and inter-personal dynamics that motivate human behavior in general, and how they specifically motivate adult learning and behavior within a wide variety of educational settings. Course includes additional, concurrent 30 -hour minimum field project requirement.

Prerequisite: graduate standing. Completion of ELP 520, Developmental Perspectives on Adult Learning, highly recommended. .

## ELP 522 - Teaching Diverse Adult Learners (4)

An examination of the theoretical, philosophical, and practical aspects of teaching adult students regarding issues of difference and diversity in the classroom. Students will develop skills in planning, delivering, and evaluating individual and group learning activities in a wide variety of learning environments. Course includes additional, concurrent 30-hour minimum field project requirement.
Prerequisite: graduate standing. Completion of ELP 520, Developmental Perspectives on Adult Learning, highly recommended. .

## ELP 523 - Assessing Adult Learning (4)

Introduction to the approaches, processes, and tools that can be used to as sess adult learning. Emphas is is givento applications at the classroomand programlevels and to practices that themselves contribute to adult learning. Course includes an additional, concurrent 30 hour minimum field project requirement.

Prerequisite: graduatestanding. .

## ELP 524 - Spiritual Leadershipfor Sustainable Change (4)

This course explores how spirituality is integrated into teaching and learning, and into the work of engaged citizens. Spiritual leadership is explored through such
themes such as: authenticity, identity, paradox, relationships, and sustainability. Community-based learning provides an opportunity to examine leadership and sustainability is sues through a spiritual lens.

## ELP 525 - Student Services in Higher Education (4)

Provides an introduction to the professional field of student affairs within the context of colleges and universities, including its his torical, philosophical, ethical, and theoretical foundations. Current and future is sues for the profession are also critically examined. Course includes an additional concurrent 30-hour minimum field project requirement.
Prerequisite: graduatestanding. .

## ELP 526 - Facilitating Student Success in Postsecondary Education (4)

Provides an introduction to theory and research related to factors and conditions that affect student success in postsecondary education and to as sessment approaches and techniques in student services. Informed by theory, research, and practice, students develop an intervention proposal related to facilitating student success and a plan for as sessing that intervention.

Prerequisite: graduatestanding. .

## ELP 527 - Legal Issues in Higher Education (4)

Provides a general introduction to the law related to higher education and professional practice in colleges and universities. In addition to the substance of related law, the course explores how the law is applied to rules and policy and how ethical standards and principles impact that application. Course includes an additional concurrent 30hour minimum field project requirement.

Prerequisite: graduatestanding. .

## ELP 528 - Leadershipin Postsecondary Education (4)

Examines emerging conceptualizations and forms of leadership and leadership development in postsecondary education. Ethical and value bases of leadership informa focus on the creation of organizational and social change within postsecondary settings. Course emphasizes nonhierarchical models of leadership that value diversity and involve collaborative relationships and collective action. Application of leadership development is sues within a variety of educational and social service organizations are explored. Course includes an additional concurrent 30-hour minimum field project requirement.

## ELP 529 - Principles of Training and Development (3)

Examination of the principles of training and development with emphas is on applying adult learning theory to the
training function. Es sential principles include those related to developing training objectives, selecting training methods and resources, sequencing the learning experiences, and evaluating the training. Designed for trainers froma variety of work settings with a strong background in a content area who have little background in adult learning theory and its application to training and development practices.
Also offered for undergraduate-levelcredit as ELP 429 and may be taken only once for credit.

## ELP 530-Course Design andEvaluation (4)

Examination of the field of instructional programdesign for adult learners within the training and development field, in educational and non-educational org anizational settings. Focus on learning to design and manage instructional activities in response to training needs and skills analyses. Students are required to select and use an appropriate design model, design a preliminary needs assessment, develop programgoals and learning objectives, develop an instructional plan, develop a plan to as sess student learning and evaluate the program, and critically review the design document. Major emphasis given to developing the instructional design document that demons trates a student's ability to align and integrate effectively all aspects of the design process and to incorporate adult learning theory. Expected preparation: ELP 429/529.

Also offered for undergraduate-levelcredit as ELP 430 and may be taken only once for credit. .

## ELP 531 - Contemporary Issues in Training and Development (3)

Building on competencies developed during previous courses in the training and development series, provides a culminating experience to the series. Provides an opportunity for students to examine national and local trends in training and organizational development and to prepare for ongoing professional growth in the context of contemporary is sues in the field. Expected preparation: ELP 429/529 plus two other courses in the series.
Also offered for undergraduate-levelcredit as ELP 431 and may be taken only once for credit. .

## ELP 532 - Training Methods (3)

Focuses on instructional strategies and effective delivery of training programs necessary for enhancing adult learning and professional development. Students will examine individual learning preferences and multiple types of active pedagogy for increasing transfer of learning. In addition, various techniques and tools for linking learning outcomes with organizational goals will be addressed.
Also offered for undergraduate-levelcredit as ELP 432 and may be taken only once for credit. Prerequisite: ELP 429/529.

## ELP 533 - Planning and Budgeting in Posts econdary Education (4)

Provides an introduction to the planning and budgeting processes used in colleges and universities. Major emphasis is placed on key concepts, planning models, and applications to ins titutional cases. Strategies for linking planning and budgeting function will be explored. Students will examine and use various planning and budgeting tools and techniques. Budget reduction and the connection between planning and assessment will be examined.

Prerequisite: graduatestanding. .

## ELP 534 - Leadership of the Training Function (3)

Focuses upon research-based, practical approaches for leading, managing, and evaluating the training and development function in organizations. It explores the role of training and development in achieving individual and organizational goals, as well as strategies and resources used in effective personnel development. Students analyze how to: develop, manage and ev aluate the training function; identify strategies and resources for effective training management; and diagnose how theorganization's culture and needs affect the selection and success of training management efforts.

Also offered for undergraduate-level credit as ELP 434 and may be taken only once for credit. . Prerequisite: ELP 429/529. .

## ELP 535-Organization Transformation through Training and Development (3)

Designed for managers of the training and development function in organizations, this course focuses on the role of training and development in organization transformation, improvement, and change. The course provides opportunities to bring real workplace examples into the clas sroomand to apply organization development and systems theory in the development strategies for org anization improvement through the training and development function.
Also offered for undergraduate-level credit as ELP 435 and may be taken only once for credit. . Prerequisite: ELP 429/529. .

## ELP 536 - Postsecondary Curriculum (4)

Provides an introduction to the field of curriculumor programdesign for adult learners and introduces students to a process of programplanning and development. Curriculum development or design is viewed as both a technical and political process. It also provides a historical and philosophical perspective on postsecondary curriculum, with attention given to review and analysis of current practices and issues, including life-long and collaborative learning. A comprehensive programplanning model will be examined.

Prerequisite: graduatestanding. .

## ELP 537 - Policy and Governance in Postsecondary Education (4)

An examination of theory and research that relates to how policy is formulated and implemented in postsecondary environments. The course focuses on the policy and governance role of faculty, administrators, and trustees at the single college or university level, and state and federal roles in postsecondary policy and governance.
Prerequisite: graduatestanding. .

## ELP 538 - Contemporary Issues in Postsecondary Education (4)

The course is designed to provide students with an introduction to the study of postsecondary education using as the vehicle a focus on some of the more pressing issues currently facing postsecondary education. The course is designed to increase the capacity for the identification and analyses of is sues and the development of positions relative to the issue.

Prerequisite: graduatestanding. .

## ELP 539 - Developing Training Materials (3)

Focus on the theories, knowledge and skills necessary to plan, develop and useeffective participant and presentation training materials that enhance adult learning in training and development settings. Study the linkage of instructional design, adult learning representational systems and graphic design theories and how materials increase transfer of learning. In addition, examine writing is sues relevant to effective communication, the selection and use of production methods, and project plans for training materials.

Also offered for undergraduate-levelcredit as ELP 439 and may be taken only once for credit.

## ELP 540 - Urban Farm Education: Leveraging Policy and Research to Cultivate Garden-Based Education in Practice (4)

Students explore the policy and research context surrounding garden-based education in schools and communities with a focus on instructional design and as sessment. As a learning community, students examine how policies and educational practices can pose barriers or potential leverage points for systemic change, and develop and teach integrated garden-based curriculum.
Also offered for undergraduate-levelcredit as ELP440 and may be taken only once forcredit.

## ELP 541 - The Community College (4)

An introduction to the two-year college in the United States, with an emphasis on the public community college with a comprehensive educational program. Topics include: transfer studies; career education; general
education; community services; basic skills education; and student development services. The purpose of the course is to provide students with theoretical and practical knowledge relative to the history, philosophy, students, staff, services, and patterns of org anization of the public community college.

## ELP 542 - Introduction to Service-Learning: Theoretical \& Pedagogical Perspectives in Postsecondary Education (4)

Fundamental principles and practices of service-learning in postsecondary education. Service-learning pedagogy, its relationship to adult development, his torical foundations in educational institutions, and civic education. Res ources and org anizations, and issues of race, class, gender, and power in service-learning. Required participation in a service-learning project provides practice in application of theories.

## ELP 543 - Service-Learning \& Community Based Learning in Postsecondary Educational Leadership \& Policy Dom (4)

Service-learning in postsecondary educational institutions, their leadership, and policy. Role, org anization, and policy of service-learning in different postsecondary institutions, from community colleges through graduate schools, and the varying ways in which service-learning is structured, researched, and assessed. Practical and theoretical concems in an applied service-learning experience in the metro area. Challenges and opportunities of partnerships between academic institutions and community-based organizations. Implications of service-learning for students, faculty, partners, and the community in the context of civic engagement, social justice, and social change.

## ELP 544 - eLearning Instructional Design (3)

Design of a self-pacedeLearning simulation with appropriate instructional methods, user interface designs, media choices, and levels of interactivity and engagement. Expected preparation: ELP 584 or ELP 529.

Also offered for undergraduate-level credit as ELP 444 and may be taken only once for credit. .

## ELP 545 - Developing eLearning (4)

Examination of development methodologies/processes, principles of taskidentification, risk mitigation, technical architecture, creative tools, and project management strategies used in developing eLearning. Application of learning theory to the development of eLearning. Expected preparation: ELP 529 and ELP 530.

Also offered for undergraduate-levelcredit as ELP445 and may be taken only once for credit. .

## ELP 546 - Early Childhood Education: Relationships with Home and Society (3)

Considers the sociology of families and communities in the development of cooperative relationships with programs for young children.

Also offered for undergraduate-levelcredit as ELP 446 and may be taken only once for credit. . Prerequisite: Undergraduate early childhood education coursework or teaching experience with young children. .

## ELP 547 - Administration of Early Childhood Programs (3)

Examines theory and practice informing the administration/leadership of early childhood programs to include: 1) organizational configurations, 2) leadership and the dynamics of the work group, 3) developmentally appropriate curriculum, 4) interaction with families of young children, and 5) significance of poverty, race, and gender for such programs.

Also offered for undergraduate-levelcredit as ELP 447 and may be taken only once for credit. . Prerequis ite: child and family studies major or admission to an education graduate program. .

## ELP 548 - Global Political Ecology (4)

To study the connections between political, economic, social, and ecological issues, we explore the following themes: the impact of globalization on human and nonhuman communities; the relationship between poverty and environmental degradation; the dis tribution of resource use and commodification in the global North and global South; and our own relationships to food systems. Students apply these concepts through a multi-media study and presentation of a commodity in terms of its production, distribution and consumption.

## ELP 549 - Service-Learning \& Community Based Learning in Postsecondary Educational Leadership \& Policy Intl (4)

Service-learning in postsecondary educational institutions, their leadership, and policy. Role, org anization, and policy of service-learning in different postsecondary institutions, from community colleges through graduate schools, and the varying ways in which service-learning is structured, researched, and assessed. Practical and theoretical concems in an applied service-learning experience abroad. Challenges and opportunities of international servicelearning. Implications of service-learning for students, faculty, partners, and the community in the context of civic engagement, social justice, and social change.

Also offered as ELP 649 and may be taken only once for credit.

## ELP 550 - Leadershipfor Sustainability (4)

Students review, analyze, and apply approaches to sustainability leadership through collaborative, holistic, experiential learning. Key themes explored include the meaning of sustainability leadership; approaches, strategies, and skills used by sustainability leaders; whole systems thinking and design; the role of eco-spiritual values and Traditional Ecological Knowledge(TEK) in sus tainability leadership; and the importance of collaboration, creativity, relationships, and reflection. Students apply these concepts directly to a sustainability leadership challenge at the Learning Gardens Laboratory.

## ELP 551 - Social Foundations of Education (4)

Study of sociological theories that illuminate the effects of education on individuals and society. Problemareas in race, class, and gender are explored in the process of examining theories of socialization, certification, allocation, and legitimation and their application to historical and current educational situations.

Also offered for undergraduate-level credit as ELP 451 and may be taken only once for credit.

## ELP 552 - History of Education (3)

A general review of the growth and development of education in relation to the civilization of the times; emphas is is placed upon the development of educational theories at various points in history.
Also offered for undergraduate-level credit as ELP452 and may be taken only once for credit.

## ELP 553 - History of American Education (4)

The his torical development of the American educational system, fromEuropean backgrounds and colonial beginnings to the present time.

Also offered for undergraduate-level credit as ELP 453 and may be taken only once for credit.

## ELP 554 - Philosophy of Education (4)

Study and comparison of the philosophical bases of educational ideas and of the educational implications of philosophical thought. ELP 554 includes an additional, concurrent 30 hour minimum field project requirement.
Also offered for undergraduate-level credit as ELP 454 and may be taken only once for credit. .

ELP 557-Cultural Pluralismand Urban Education (4)
This course is designed to explore the process of education policy development and implementation in culturally diverse, urban environments. The course is organized
around several cultural pluralis m pers pectives; among the topics to be explored are the is sues of socialization of the child, governmental operations, educational adminis tration, teacher preparation and curriculumdesign. ELP 557 includes an additional, concurrent 30 hour minimum field project requirement.

Also offered for undergraduate-levelcredit as ELP 457 and may be taken only once for credit. .

## ELP 558 - Educational Leadership (4)

Analysis of leadership theories, skills, and techniques as applied to the organization and administration of public education.

Prerequisite: graduate standing. .

## ELP 559 - The Principalship (4)

Designed to develop complementary theoretical and practical understanding of the principalship; to acquire knowledge and to learn practices and skills needed to become a successful first-year principal.

Prerequisite: ELP 569. .

## ELP 560 - Supervision and Evaluation of Instruction (4)

The role of the supervis or in keeping education geared to the changing demands of society; theories of leadership; group processes and individual conference techniques; action research and related approaches to curriculum change; analysis of concrete supervisory problems.

## ELP 561 - Staff Development: Planning, Implementation, and Evaluation (4)

Staff development goals; characteristics of staff development programs; establishing a staff development org anization; policy and decision-making; identifying and res ponding to the concerns of participants; assessing needs; planning and implementation of specific programs; networking; formal and informal methods of evaluation; models forstaff development; programevaluation; management information systems; evaluating instructional effectiveness.
Prerequisite: graduatestanding. .

## ELP 562 - School and Community Relations (4)

An intensive examination of the school and its environment. Major emphasis is on the linking mechanisms utilized by the school in interacting with parents, citizens, and special interest groups. Course includes an additional, concurrent 30 hour minimum field project requirement.
Prerequisite: graduate standing. .

## ELP 563 - Human Relations in Educational Organizations (4)

Is sues and perspectives in group processes; models for studying groups; principles of group dy namics; human relations within educational org anizations; strategies for group problem-solving and conflict management; application of group dy namics to leadership, communication, and decision-making within educational org anizations; evaluating processes and production of educational groups.

Prerequisite: graduatestanding. .

## ELP 564 - Administration of Curriculum (4)

Provides a broad and critical understanding of curricular matters that are relevant and important to administrators: 1) decision making about thechoice of content; 2) politics of curriculumdevelopment; 3) implementation and monitoring of curriculumat building site; 4) testing and alignment of curriculum; and 5) evaluation of curriculum implementation.
Prerequisite: graduatestanding.

## ELP 565 - ELL School Community Relations (3)

Learn how to work with families to overcome barriers to setting-up support systems in and out of school. Access appropriate community res ources that can be critical for ensuring classrooms uccess with ELL students. Gain understanding about other cultures' orientations to education and school. Learn strategies to build bridges between home, school, and the community.

Also offered for undergraduate-level credit as ELP 465 and may be taken only once for credit.

## ELP 566 - Impact of Language and Culture in the Classroom (3)

Learn the importance of intercultural communication in working with children from a wide range of cultures in today's classroom. Survey the cultural, linguistic, educational, and ethical issues present in all classrooms today. Study the sociological and language is sues and immigration his tory. Learn how to identify and appreciate cultural factors that affect social adjustment and learning.
Also offered for undergraduate-level credit as ELP 466 and may be taken only once for credit.

## ELP 567 - ESL/Bilingual ProgramDesign andModels

 (3)Exemplary schools provide second language learners with a rich intellectual diet, not a remedial or basic skills curriculum. They expect all students to achieve high standards in literacy and other academic areas. Learn how these schools combine their understandings and apply the knowledge of local, state, and federal laws and policies along with pedagogical considerations to create effective
programs. Participants will examine a variety of local, regional, and national programmodels for ESL and Bilingual instruction. This will create opportunities to develop expertise in assessing the critical components of programs serving pre-school through adults.
Also offered for undergraduate-levelcredit as ELP 467 and may be taken only once for credit.

## ELP 568 - Educational Organization and Administration (4)

Examination of the role, functions, and responsibilities of the educational leaders and administrators; study of administrative and organizational theory and its application to the operation of educational programs and organizations in various settings, including school districts, higher education and educational divisions in private sector org anizations. Course includes an additional, concurrent 30 hour minimum field project requirement.
Prerequisite: graduate standing. .

## ELP 569 - Principal Leadership: Introduction to Educational Administration (4)

Introduces leadership for equity through examining responsibilities and roles of school leaders with an emphasis on culture and equity: professional norms; decision-making; educational values; ethical behavior; socio political awareness; equitable protocols; equitable opportunity and access; culturally res ponsive practices; an inclusive school community; and promotion of cultural pluralis mthrough programs, policies, and practices that reduce educational dis parities and increase wellness and success for all students.

Prerequisite: Admission to Principal License Program.

## ELP 570 - Principal Leadership: Human Relations and Educational Foundations (4)

Explores the historical, social, philosophical, and organizational foundations of public education to develop mission, vision, and core values as a principal. Examines the dynamics of school personnel, relationships, leadership, and community building in schools to promote each student's academic success and well-being, with a strong focus on equity and culturally res ponsive practices.
Prerequisite: Admission to Principal License program.

## ELP 571 - Principal Leadership: Teaching, Learning and Curriculum (4)

Candidates develop intellectually rigorous, culturally responsive, and coherent systems of curriculum, instruction, and assessment to promote each student's academic success and well-being. Candidates will be mindful of TSPC ethical standards for principals and developing professional practice of school pers onnel. The course focuses on equity, cultural responsiveness, and high-leverage practices for historically underserved
students and those receiving English Learner and Special Education services.

Prerequisite: Admis sion to Principal License Program.

## ELP 572 - Principal Leadership: Human Resource Development and Organizational Change (4)

In this course candidates develop theclinical practice skills and dispositions to promote a caring, culturally responsive community of support for students by engaging families and the community meaning fully to support $\mathrm{pk}-12$ student well-being and academic success, managing equitable systems, with emphasis onhistorically underserved students, resources, school personnel, ins tructional management, and in creating ethical systems.
Prerequisite: Admis sion to PrincipalLicense Program.

## ELP 573 - Principal Leadership: Project I (1)

Focus on a PrincipalLeadership Project demonstrating knowledge, skills, and dispositions required by the TSPC Principal License Standards. The first part of a threequarter project is designed with an adminis trative practicumsupervis or to address equity of educational opportunity and culturally res ponsive practices to promote each intern's academic success and well-being. In collaboration with school personnel, students, families, and/or the community, candidates identify the challenge area; research the problemcontext and related peer-review research; and develop an action plan.
Prerequisite: Admis sion toPrincipal Licensure Program.

## ELP 574 - Principal Leadership: Project II (1)

Focus on a Principal Leadership Project demonstrating knowledge, skills, and dis positions required by the TSPC Principal License Standards. The second quarter of a threequarter project designed with an administrative practicum supervis or to address equity of educational opportunity and culturally responsive practices to promote each student's academic success and well-being. Candidates create a visual dis play of their theory of action, design an improvement aim, primary drivers, secondary drivers and change ideas. Three Plan, Do, Study Act(PDSA) cycles are completed.
Prerequisite: Admis sion to the Principal License Program.

## ELP 575 - Principal Leadership: Project III (1)

Candidates will learn and apply change leadership strategies that demonstrate knowledge, skills, and dispositions required by TSPCPrincipal License Standards through a Principal Leadership Project. The final quarter of a three-quarter project designed with an administrative supervis or to address equity of educational opportunity and culturally responsive practices to promote each student's academic success and well-being. Candidates analyze the outcome of their year-long project, identify implications
for further action, and reflect on leadership challenges and successes.

Prerequisite: Admission to the Principal License Program.

## ELP 576 - District Leadership: Instructional Equity (4)

Effective educational leaders cultivate a strong mis sion, vision, core values within a culturally responsive curriculum, instruction and assessment for district improvement. Candidates will develop knowledge, skills, profes sional dispositions and cultural competencies, in a district adminis trativecapacity, to meet TSPC Standards 1, (mis sion, vision, core values); TSPC4 (Curriculum, Instruction, and Assessment); and TSPC10 (School Improvement). Embeds a 30-hour authentic, dis trict-based, clinical experience. This course is taken concurrently with ELP 509 District Leadership Adminis trative PracticumI.

Prerequisite: Admission to Professional Administrator License Program. Corequisite: ELP 509 District Leadership Administrative PracticumI.

ELP 577 - District Leadership: Professional Capacity and Engagement of Staff and Community (4)
Effective educational leaders develop the professional capacity, practice and community of teachers and other staff to promote student success and well-being. This includes engaging in meaningful ways with families and the community. Candidates will develop knowledge, skills, professional dispositions and cultural competencies, in a district adminis trative capacity, to meet the corresponding TSPC Standards. At the center of the course, candidates willengage in a 30-hour coherent, authentic, district-based, adminis trative practicum experience.
Prerequisite: Admission to Professional Administrator License program.

## ELP 578 - District Leadership: Mission, Vision, and Values of Ethics and Equity (4)

Effective educational leaders enact ethics and professional norms, in a culturally res ponsive district setting in a culturally responsive educational setting for each student's academic success and well-being. Using professional norms, they advocate and strive for equity of educational opportunity. Candidates will develop knowledge, skills, profes sional dispositions and cultural competencies, in a district adminis trativecapacity, to meet TSPC Standard2 Ethics and Professional Norms) and 3 (Equity and Cultural Responsiveness) with a strong shared district mis sion. Embeds a 30-hour coherent, authentic, dis trict-based, clinical experience.
Prerequisite: Admission to Professional Administrator license program.

## ELP 579 - District Leadership: Continuous Improvement, Operations and Management (4)

Effective educational leaders act as agents of continuous improvement promoting studentacademic success and well-being, in the context of equity and culturally responsive practices. This includes managing operations and distributing resources in support of improvement efforts. Candidates will develop knowledge, skills, professional dispositions and cultural competencies, in a district adminis trativecapacity, to meet the corresponding TSPC Standards. At the center of the course, candidates will engage in a 30 hour coherent, authentic, district-based, clinical experience.
Prerequisite: Admis sion to professional administrator license program.

## ELP 580 - District Leadership: Equity, Instruction and Care for Students (3)

Effective educational leaders develop a culturally responsive, dis trict-wide community of care and support for students resulting in a coherent academic systemof support aligned with the dis trict mis sion, vision and core values. Candidates will deepen and apply knowledge and skills in a dis trict adminis trator capacity to meet the corresponding TSPCStandard 1 (mission, vision and core values), 3 (Equity and Cultural Responsiveness), 4 (Curriculum, Instruction, and Assessment), and 5 (Community of Care). Embeds a 30-hour coherent, authentic, district-based, clinical experience.

Prerequisite: Admis sion to Professional Administrator licensure program.

## ELP 581 - District Leadership: Ethical Management and Levers for Improvement (3)

Effective educational leaders act ethically and according to professional norms promoting student success and wellbeing. This is evidenced by the way they act as change agents for continuous improvement while managing operations and ensuring equitable distribution of res ources. Candidates will deepen and apply knowle dge and skills in a district adminis trator capacity to meet the corresponding TSPC Standards. At the center of the course, candidates will engage in a 30 -hour coherent, authentic, dis trict-based, clinical experience.
Prerequisite: Admis sion to Professional Administrator License Program.

## ELP 582 - Teaching, Learning and Curriculum I (2)

Examines the role of effective school leadership for best practices in teaching, learning and curriculum which promote the success of all students. Students will examine those factors which make supervision and evaluation really work, i.e., contribute to the larger purpose of building an environment where teachers can deliver their best and children can learn the most.

Prerequisite: admission to Initial Adminis trator Licensure Program.

## ELP 583 - Teaching, Learning and Curriculum II (2)

Examines the complex relationships between staff evaluation, individual professional development, staff development, and effective teaching, learning, and curriculum. Students will formulate a working knowledge of the change process, staffing, program, and faculty needs within an educational setting through problem-based learning.
Prerequisite: admission to Initial Adminis trator Licensure Program.

## ELP 584 - Strategies for eLearning (3)

Best practices in eLearning and pedagogical is sues related to design, development, and delivery. Application of research in learning and cognition to eLearning fordesign, analys is and problemsolving.
Also offered for undergraduate-levelcredit as ELP 484 and may be taken only once for credit.

## ELP 585 - Principal Leadership: Linguistically and

 Culturally Diverse Students and Families (4)Promoting the success and well-being of each student, teacher/leader through administrative practicum experiences, supported by faculty supervis or and principal mentor. Explore theories, law, and research; ensure equitable protocols, opportunity and access, res ponsive practices, create an inclusive school community. Concepts relevant to English Language Learners: language acquisition; the nature/role of culture/cultural groups; planning, implementing, managing instruction; assessment; profes sionalism; advances in ESL field; public policy; technology.
Prerequisite: Admission to Principal License Program.

## ELP 586 - Principal Leadership: High Leverage Practices to Promote Inclusion and Equity (4)

Examines schooladministrators' roles and responsibilities in supporting special education services, programs, teachers and staff. Understand special education law and implications for working with students, families and district leadership. Explore school-wide systems, interventions and processes to address the support needs (e.g. academic, behavioral and social/ emotional) of all students, particularly those students with Individualized Education Programs. Includes 30 hours of clinical practice.

Prerequisite: Admission to the Principal License Program.

## ELP 587 - District Leadership: Professional Capacity, Community, Engagement (3)

In this course, candidates apply leadership strategies that develop the professionalcapacity of school personnel and members of school community to teach, support students,
and lead with a focus on equity and wellness; foster a professional community of teachers and professional staff to promote a systemof support and continuous improvement to ensure equitable outcomes for students; and engage families and community in culturallyresponsive ways that promote each student's academic success and well-being. Taken concurrently with ELP 509 District Adminis trative PracticumII.
Prerequisite: Admis sion to Professional Administrator License Program. Corequisite: ELP 509.

## ELP 594 - School Law (4)

Critical analys is of the legal framework governing school law in the United States, with emphasis on contemporary legal problems of education. Implications of landmark and current court decisions.

Prerequisite: graduate standing. .

## ELP 601 - Research (1-9)

(Credit to be arranged.)

## ELP 602 - Independent Study (1-9)

(Credit to be arranged.)

## ELP 603 - Diss ertation (1-16)

(Credit to be arranged.)

## ELP 604 - Cooperative Education/Internship (1-9)

(Credit to be arranged.)

## ELP 605 - Reading and Conference (1-9)

(Credit to be arranged.)

## ELP 606 - Special Problems/Projects (1-6)

(Credit to be arranged.)

ELP 607 - Seminar (1-6)
(Credit to be arranged.)

## ELP 608-Workshop(1-9)

(Credit to be arranged.)

## ELP 609 - Practicum(0-9)

(Credit to be arranged.)

## ELP 610 - Selected Topics (1-9)

(Credit to be arranged.)

## ELP 616 - Collaborative Ethnographic Research Methods (4)

Explores if and how a participatory and collaborative form of research will foster knowledgedemocracy, and give ownership to those whose knowledge it is. Methodologies covered are: different genres of qualitative methods, community-based planning and research, participatory action-research, Gaian participatory science, classical ethnography, auto-ethnography, ethnographic performance, life his tories, feminist methodologies, and "dialogue circles."

Also offered as ELP 516 and may be taken only once for credit.

## ELP 617 - Ecological and Cultural Foundations of Learning (4)

Explores how we teach and learn ecologically and what constitutes ecological and cultural ways of knowing. One of the key foundational courses for LECL specialization, this course is beyond simply justifying or advocating that our education should be grounded in ecological principals. Rather it offers an opportunity to engage in critical and comparative analyses of what has been already accomplished and the new areas of innovations in environmental education, mature education, outdoors education, naturalist training, and other such genres.

Also offered as ELP 517 and may be taken only once for credit.

## ELP 649 - Service-Learning \& Community Based Learning in Posts econdary Educational Leadership \& Policy Intl (4)

Service-learning in postsecondary educational institutions, their leadership, and policy. Role, organization, and policy of service-learning in different postsecondary institutions, from community colleges through graduate schools, and the varying ways in which service-learning is structured, researched, and assessed. Practical and theoretical concems in an applied service-learning experience abroad. Challenges and opportunities of international servicelearning. Implications of service-learning forstudents, faculty, partners, and the community in the context of civic engagement, social justice, and social change.
Also offered as ELP 549 and may be taken only once for credit.

## ELP 658 - Social, Historical, Philosophical, and Cultural Foundations of Education (4)

Seminar for education doctoral students providing a detailed exploration of texts with a focus on the institutional aspects of education, the intellectual currents that have supported it, and the social constructs that maintain it. Cultural, his torical, social, philosophical, and critical and feminist perspectives as well as modernist viewpoints are included. Participants will read in-depth and write analytical res ponse papers as a grounding for discussion in the seminar and will produce an end of term project or research paper.
Prerequisite: admis sion to the Graduate School of Education doctoral programor permission of instructor. .

## ELP 659 - Theory, Research, and Practice in

 Educational Administration (4)Seminar for education doctoral students providing a detailed exploration of research and theory development in the field of educational administration. Participants will read in-depth and write analytical response papers as a bas is for dis cussion in the seminar and will produce a term project or research paper.
Prerequisite: admis sion to the Graduate School of Education doctoral programor permission of instructor. .

## ELP 801 - Research (1-9)

(Credit to be arranged.)

## ELP 802 - Independent Study (1-9)

(Credit to be arranged.)

## ELP 804 - Cooperative Education/Internship (1-9)

(Credit to be arranged.)

## ELP 805 - Reading and Conference (1-6)

(Credit to be arranged.)

ELP 806 - Special Problems (1-6)
(Credit to be arranged.)

ELP 807 - Seminar (1-6)
(Credit to be arranged.)

## ELP 808 - Workshop(1-9)

(Credit to be arranged.)

## ELP 809 - Practicum(0-9)

(Credit to be arranged.)

## ELP 810 - Selected Topics (0-9)

(Credit to be arranged.)

## EMCR - Emergency Management

## EMCR 520 - Anatomy and History of Disasters (4)

This is survey of major natural disasters (both geological and weather related ones) that affect humans, focusing on causes, effects, recovery, planning and prediction. Many case histories will be covered with an emphasis on the Pacific Northwest.

## EMCR 530 - Building Community Resilience (4)

Introduction to resilience theory, concepts, and applications in a hazards planning and dis aster management. Surveys sociological, public adminis tration, and planning theory literature to understand risk, resilience, and methods to address these at the community level.

Cross-Listed as: This is the same course as USP 530 and may be taken only once for credit.

## EMCR 535 -Strategies for Organizing Recovery, Mitigation and Resilience (3)

Application of resilience concepts in the policy and planning context. The course provides tools for using resilience concepts in policy making, policy analysis, and hazards and dis aster planning. Introduces practical tools for analyzing community vulnerabilities and actions to take to improve resilience.

Cross-Listed as: This is the same course andPA 535 and may be taken only once for credit.

## EMCR 545 - Risk and Strategic Communication (4)

Examination of the theoretical background and the intricacies of risk communication, with a focus on strategic communication. Fromhealth crises to earthquakes to environmental dis asters, this course explores several modern day challenges through a series of cases studies and exercises emphasizing preparation/mitigation, audience analysis, message development, communication
channel identification, and outcome evaluation. Expected preparation: research methods.

Prerequisite: Graduate standing. Cross-Listed as: This is the same course as Comm 545 and may be taken only once for credit.

## EMCR 560 - Climate Resiliency Planning (3)

Aims to examine the res ponse of society to a changing climate, with an emphas is on the practices, processes, and programs that can improve the resiliency of communities to climate-induced impacts. We will investigate what it means to be "resilient", exploring principles from planning, sociology, engineering, environmental studies, and disaster studies, and other related fields. We will also pay special attention to the interplay between social inequality, poverty, social exclusion and vulnerability to natural disaster.

Cross-Listed as: This is the same course as USP 560 and may be taken only once for credit.

## EMCR 567 - Community Resilience in Coupled SocioEcological Systems (4)

Examines community vulnerability, adaptation, and resilience to environmental risks and hazards in the coupled human and natural systems froma geographical and spatial science perspective. Focuses on US and international case studies in major urban areas to investigate the questions of"why, when, for whom, and how" of community resilience across scales.

Cross-Listed as: This is the same course as Geog 567 and may be taken only once for credit.

## EMCR 587 -Principles and Practices of Emergency Management (3)

Explores the history, doctrines, and auth orities of emergency management as well as the role of the emergency manager. It provides background on this emerging field as well on theoretical foundations of effective emergency management and strategies for effective emergency management leadership.

Cross-Listed as: This is the same course as PA 587 and may be taken only once for credit.

## EMCR 588 - International Perspectives on Disaster Management \& Resilience(3)

Narratives, images, and res earch across the globe continue to document the devastating effects of disasters, both human-made and natural. This documentation demonstrates the monumental effects disasters canhave on human life, infrastructure, and the natural environment, let alone an economy. Emergency management systems vary across nations and cultures, reflecting differential challenges, government types and capacity, public involvement and commitment to response, and cultural backgrounds.

Cross-Listed as: This is the same course as PA 588 and may be taken only once for credit.

## EMCR 591 - Culture, Vulnerability and Disaster

 Resilience (4)This class discusses the distinctions between natural hazards and dis asters, human-made and naturalevents, and sudden and slow-moving catastrophes. It considers the effects of preexisting social inequalities (e.g., race) and vulnerabilities (e.g., poverty) and examines individual, household, and community resilience as a function of social networks and social capital. The class als o explores the roles of perceived risk, connectivity, and social memory. It concludes with an analysis on the successes and failures of humanitarian aid.

Cross-Listed as: This is the same course as Anth 591.

## EMCR 595 - Capstone Seminar in Emergency

 Management and Resilience (4)This seminar is the capstone experience for the Emergency Management and Community Resilience Program. It provides the opportunity to integrate the skills and perspectives of core courses with teamlearning generated through experiential learning. Students in the capstone seminar, working as a team, will develop a dis aster management or business continuity plan for a public, private, or nonprofit org anization that requests assistance in preparing a disaster response plan. Teams will make presentations of their plans at the end of the term.

Prerequisite: Students must complete all core courses and 45 credits of coursework in the programprior to enrolling in this capstone seminar.

## Eng - English

## Eng 100 - Introduction to Literature (4)

An introduction to the study of stories, plays, poems, and essays. Includes representative approaches for studying literature and writing about it. Recommended especially for students with no previous college-level coursework in literature.

## Eng 104 - Introduction to Fiction (4)

Reading and analysis of significant works of fiction.

## Eng 105 - Introduction to Drama (4)

Reading and analysis of significant works of drama.

## Eng 107 - Introduction to WorldLiterature (4)

An introduction to significant literary works from different regions, cultures, and periods.

## Eng 199 - Special Studies (1-6)

See department for course description. (Credit to be arranged.)

## Eng 201 - Introduction to Shak espeare (4)

Study of Shakespeare's plays and poetry, with particular emphas is on understanding Shakespearean language, genres, and cultural contexts.

## Eng 204 -Survey of British Literature I (4)

An introduction to British literature fromits beginnings to the seventeenth century.

## Eng 205-Survey of British Literature II(4)

An introduction to British literature from the seventeenth century to the contemporary period.

## Eng 253-Survey of American Literature I (4)

An introduction to American literature fromits beginnings to the mid-nineteenth century.

## Eng 254 - Survey of American Literature II (4)

An introduction to American literature fromthe midnineteenth century to the present.

## Eng 260 - Introduction to Women's Literature (4)

Study of literature written by and about women across historical periods and genres. This is the same course as WS 260 and may be taken only once for credit.

Eng 299-Special Studies (1-9)
See department for course description. (Credit to be arranged.)

## Eng 106 - Introduction to Poetry (4)

Reading and analysis of significant poems.

## Eng 300 - Literary Form and Analysis (4)

Emphasizes skills in close reading, formal analysis, the specialized study of literary genres, argumentation, and the process of drafting, revising, and editing academic essays. Required for, but not restricted to, English majors.

## Eng 301U- Topics in Shak espearean Genre (4)

Study of Shakespeare's plays and poetry, focusing on specific genres with an emphasis on close reading and historical context. Course may be repeated for credit with different topics. Up to 8 credits of this course numbercan be applied to the English major.

## Eng 304-Critical Theory of Cinema (4)

An introduction to critical and historical approaches to the study of cinema, including feminism, structuralism, sociological criticism, and ps ychoanaly sis, with discussion of cinema as art form and cultural commodity.

## Eng 305U - Topics in Film (4)

Study of film as text, including auteur, formalist, historical, and cultural perspectives. Course may be repeated for credit with different topics. Up to 8 credits of this course number can be applied to the English major.

## Eng 306U- Topics in Literature and Popular Culture (4)

Study of literary forms in popular culture, including such topics as fantasy, the graphic novel, and detective fiction. Course may be repeated forcredit with different topics. Up to 8 credits of this course number can be applied to the English major.

## Eng 307U-Science Fiction (4)

Study of science fiction, including its subgenres, media, histories, and cultural influences.

## Eng 309U- Indigenous Nations Literature (4)

Introduction to the literatures and cultures of the indigenous nations of North America, fromoral and ceremonial practices to contemporary fiction and poetry. Includes discussion of his torical, political, and social contexts as well as relevant is sues such as colonialism, sovereignty, stereotyping, and cultural authenticity.

## Eng 310U- Topics in Children's and Young Adult Literature (4)

Study of literary works written for young audiences, with attention to constructions of childhood and family in changing cultural contexts. Topics vary by genre, his torical period, geographical region, author, theoretical approach, or theme. Course may be repeated forcredit with different topics. Up to 8 credits of this course number can be applied to the English major.

## Eng 311 - Tragedy (4)

Study of the generic conventions and important aspects of tragedy in world literature.

## Eng 312 - Comedy and Satire (4)

Study of literary works and popular media that emphasize the features and techniques of comedy and satire, investigating concepts such as genre, humor, irony, and laughter.

## Eng 313U - The American ShortStory (4)

A survey of the American short story, fromits beginnings in the 19th century to the present.

## Eng 314 - The Epic (4)

Study of the epic in Western and/or world literature, focusing on the characteristics of the genre and its aesthetic and moral dimensions.

## Eng 315 - Poetry and Form (4)

Study of poems and poetic forms across historical periods and cultures.

## Eng 316 - The ShortStory (4)

A survey of the short story as it developed fromthe tale, the legend, and the anecdote to its modern form. Although fiction from many literatures will be studied, all works will be read in English.

## Eng 317U - Greek Mythology (4)

Greek mythology as recorded by Homer, Hesiod, Ovid, and various of the Greek play wrights and philosophers. Special attention is given to the Greek legacy of ideas, themes, figures, and images.

## Eng 318U- The Bible as Literature (4)

Study of the Hebrew Bible and Christian New Testament as literary anthologies of the ancient Near East, emphasizing cultural and historical contexts, political and theological his tories, and close readings of the texts.

## Eng 319U- Northern European Mythology (4)

Norse and Celtic mythologies in medieval texts.

## Eng 320U- The English Novel I (4)

Study of the English novel fromearly fictional forms to the eighteenth century.

## Eng 321 - The English Novel II (4)

Study of the English novel from the nineteenth century to the present.

## Eng 325U- Postcolonial Literature (4)

Introduction to key texts, themes, issues, and approaches in postcolonial literature and theory.

## Eng 326 - Literature, Community, and Difference (4)

Examines the relationship between cultural production and the formation, practice, and representation of social identities.

## Eng 327 - Culture, Imperialism, and Globalization (4)

Examines cultural encounter and its effects. Topics may address various historical periods and geographical regions, but they will share a focus on connecting aes thetics to the political and institutional contexts of imperialism and globalization.

## Eng 330U- Jewish and Is raeli Literature (4)

Introduction to modern Jewish literature in its diasporic and national contexts. Emphasis on the transition from sacred to secular literature; reflection of historical and social realities; development of literatures in Europe and the Middle East.

Eng 331U - Introduction to Rhetoric and Composition (4)

Survey of the discipline of rhetoric and composition, including history, theory, practice, and teaching.

## Eng 332U-History of Cinema and Narrative Media I

 (4)Surveys the history of cinema and narrative media fromthe late nineteenth-century moving image to the Second W orld War.

## Eng 333U - History of Cinema and Narrative Media II

 (4)Surveys the history of cinema and narrative media fromthe end of the Second World War to the 1970s. Is sues will include the impact of postwar artistic and literary movements, postwar consumer cultures, the cold war, new wave movements, television, youth culture, and third cinemas.

## Eng 335U - Topics in Literature and Film (4)

Study of the interplay between films and literary texts, focusing on aesthetic qualities, cultural contexts, practices of adaptation, and modes of reading and spectatorship. Course may be repeated for credit with different topics. Up to 8 credits of this course number can be applied to the English major.
Cross-Listed as: NAS 335U.

## Eng 340U - Medieval Literature (4)

Study of medieval literature, including literary genres and themes, his torical and cultural contexts, and major authors and movements.

## Eng 341U-Renaissance Literature (4)

Study of sixteenth- and seventeenth-century literature, including literary genres and themes, historical and cultural contexts, and major authors and movements.

## Eng 342U - Eighteenth Century Literature (4)

Study of eighteenth-century literature, including literary genres and themes, his torical and cultural contexts, and major authors and movements.

## Eng 343U- Romanticism (4)

Study of Romantic literature, including literary genres and themes, historical and cultural contexts, and major authors.

## Eng 344U- Victorian Literature (4)

Study of Victorian literature, including literary genres and themes, historical and cultural contexts, and major authors and movements.

## Eng 345U- Modern British Literature (4)

Study of modern British literature, including literary genres and themes, his torical and cultural contexts, and major authors and movements.

## Eng 351U - African American Literature I (4)

An introduction to literature written by and about African Americans from the colonial period to the era of the abolition of slavery.
Cross-Listed as: This is the same course as BSt 351U and may be taken only once for credit.
Eng 352U- African American Literature II (4)
An introduction to African American literature from the mid-nineteenth century to the beginnings of the "Black Arts" movement.
Cross-Listed as: This is the same course as BSt 352U and may be taken only once for credit.

## Eng 353U- African American Literature III (4)

An introduction to African American literature of the postcivil rights era, from 1965 to the present.

## Eng 360U- American Literature and Culture I (4)

Study of American literature fromits beginnings to the mid-nineteenth century, including literary genres and themes, historical and cultural contexts, and major authors and movements.

## Eng 363U- American Literature and Culture II (4)

Study of American literature fromthe mid-nineteenth century to the present, including literary genres and themes, historical and cultural contexts, and major authors and movements.

Eng 367U - Topics in American Literature and Culture (4)

Study of selected as pects of American literature and culture. Topics are unified by theme and may cover multiple his torical periods. Course may be repeated for credit with different topics. Up to 8 credits of this course number can be applied to the English major.

Prerequisite: 12 credits in literature.

## Eng 368U - Literature and Ecology (4)

Study of literary representations of the environment and our relation to it, including questions of anthropocentrism and ecocentris m, environmental justice, human/non-human relations, sustainability, and globalization.

## Eng 369U - Asian American Literature (4)

An introduction to Asian American literature, including literary genres and themes, historical and cultural contexts, and major authors and movements.

## Eng 371 - The Novel (4)

A theoretical and comparative approach to the study of the novel as a literary form.

## Eng 372U-Topics in Literature, Gender, and Sexuality

 (4)Study of representations of gender and sexuality in literature and related cultural forms. Course may be repeated for credit with different topics. Up to 8 credits of this course numbercan be applied to the English major.
Cross-Listed as: This is the same course as WS 372U.
Eng 373U - Topics in Literature, Race, and Ethnicity (4)

Study of representations of race and ethnicity in literature and related cultural forms. Course may be repeated for credit with different topics. Up to 8 credits of this course number can be applied to the English major.

## Eng 377U - American Poetry I (4)

Study of American poetry fromthe Colonial period to the early twentieth century.

## Eng 378U-American Poetry II (4)

Study of American poetry fromthe early twentieth century to the beginning of the twenty-first century.

## Eng 380 - Introduction to Comparative Literary and Cultural Studies (4)

Overview of the practices, methods, and materials of comparative literary and cultural studies, with an emphasis on learning specific modes of encountering creative expression fromdifferent linguistic, cultural, and national backgrounds. Introduces students to major questions, concepts, and debates in the field as well as literary works in relation to various themes, ideas, genres, and contexts.
Prerequisite: Upper-division standing. Cross-Listed as: This is the same course as WLL380 and may be taken only once for credit.

## Eng 381 - Topics in Translation Studies (4)

Students will develop analy tical frameworks to understand translation and its implications for textual interpretation. Students work with case studies that highlight the role of translation throughout history; they also examine how methods fromTranslation Studies enrich the study of literary and non-literary texts alike. Those with secondlanguage competency can optionally develop skills to producetranslations of their own. Course may be repeated for up to 8 credits. Up to 8 credits of this course number can be applied to the English major.

Cross-Listed as: This is the same course as WLL381.

## Eng 383U- Topics in Comparative Literature, Film, and Comics (4)

Comparative study of literary, film, or comic-book genres across two or more world cultures. Students learn conventions of specific genres, significant differences between genres, and the role cultural environments play in shaping art is tic res ponses. Readings and discussions are in English. Course may be repeated for up to 8 credits. Up to 8 credits of this course number can be applied to the English major.
Cross-Listed as: This is the same course as WLL383U.

## Eng 385U- Contemporary Literature (4)

Study of contemporary prose, poetry, drama, and/or texts of other genres and media, focusing on the formal devices, intellectual undercurrents, and cultural implications of texts from a range of global, national, or regional traditions.

## Eng 387U- Women's Literature (4)

Study of works by women writers fromthe medieval period to the present, focusing on topics such as feminism, marginalization, and women's roles in the public and private spheres.

## Eng 397U - Digital Literary Studies (4)

Introduction to digital literary studies using both theoretical readings and hands-on computational exercises. Explores how net worked computers offer new contexts for reading, interpreting, and making literature and literary criticism. Focuses on using databases and archives to study and produce literary texts. No prior computer training is neces sary.

## Eng 399-Special Studies (1-5)

See department for course description. (Credit to be arranged.)

## Eng 401 - Research (0-6)

See department for course description. (Credit to be arranged.)

## Eng 402 - Independent Study (1-12)

(Credit to be arranged.)

Eng 404 - Cooperative Education/Internship (0-12)
See department for course description. (Credit to be arranged.)

## Eng 405 - Reading and Conference (0-6)

Consentof instructor. See department for course description. (Credit to be arranged.)

## Eng 407 -Seminar (1-6)

Consent of instructor. See department for course description. (Credit to be arranged.)

## Eng 408-Workshop(0-6)

See department for course description. (Credit to be arranged.)

## Eng 409 - Practicum (0-12)

See department for course description. (Credit to be arranged.)

## Eng 410 -SelectedTopics (1-6)

See department for course description. (Credit to be arranged.)

## Eng 411 - English Drama (4)

Study of important trends, traditions, and movements in English drama, examining drama both as a literary genre and as a complex mix of performance, spectatorship, cultural context, and theater history. Topics may be drawn from a range of his torical periods, frommedieval drama to the present day.
Also offered for graduate-level credit as ENG511 and may be taken only onceforcredit. Prerequisite: Eng 300 and Wr301. (Wr301 may be taken concurrently.).

## Eng 413 - Teaching and Tutoring Writing (4)

Study and practice of writing instruction in various contexts, with focus on process, evaluation, and feed back.
Also offered for graduate-level credit as Eng 513 and may be taken only once forcredit. .Prerequisite: Eng 300 and Wr301. (Wr301 may be taken concurrently.).

## Eng 414-Composition Theory (4)

Survey of composition theory, including rhetoric, cognition, pedagogy, and research across literacy contexts. Students will developand pursue research projects according to their interests.
Also offered for graduate-level credit as Eng 514 and may be taken only once forcredit. .Prerequisite: Eng 300 and Wr301. (Wr 301 may be taken concurrently.).

## Eng 415 - Research Methods in Rhetoric and Composition (4)

Study and practice of empirical and ethnographic methodologies, with focus on epistemology, ethics, and representation. Students will develop and pursue research projects according to their interests.
Also offered for graduate-level credit as Eng 515 and may be taken only onceforcredit. . Prerequisite: Eng 300 and Wr301. (Wr301 may be taken concurrently.).

## Eng 416 - History of Rhetoric (4)

Survey of rhetorical theory and practice fromclassical through contemporary contexts. Students will develop and pursue research projects according to their interests.
Also offered for graduate-level credit as Eng 516 and may be taken only once forcredit. .Prerequisite: Eng 300 and Wr301. (Wr301 may be taken concurrently.).

## Eng 420 - Caribbean Literature (4)

Study of important works and writers fromacross the
Caribbean basin with an emphasis on understanding the
historical and theoretical contexts of literary production, the cultural legacies of colonialism, and the linguistic innovations particular to the region.
Also offered for graduate-level credit as Eng 520 and may be taken only once for credit. Prerequisite: Eng 300 and Wr301. (Wr301 may be taken concurrently.).

## Eng 422 - African Fiction (4)

Study of literary and cultural production fromthe African continent, focusing on topics such as colonialis $m$, national liberation, globalization, gender, and the relationship between art and politics. Includes some consideration of the question of language and the appropriation of Western literary conventions.
Also offered for graduate-level credit as ENG 522 and may be taken only once for credit. Prerequisite: Eng 300 and Wr301. (Wr301 may be taken concurrently.).

## Eng 426 - Advanced Topics in Medieval Literature (4)

Study of MedievalEnglish literature (c. 800-1500), including Anglo-Saxon works, continental vernacular and Latin medieval writing, and the Middle English vernacular tradition. Students will have some opportunity to learn to read Old and Middle English. Course may be repeated for credit with different topics. Up to 8 credits of this course number can be applied to the English major.
Also offered for graduate-level credit as Eng 526. Prerequisite: Eng 300 and Wr301. (Wr301 may be taken concurrently.).

## Eng 428 - Canons and Canonicity (4)

Examines the historical, institutional, and ideological contexts in which traditions of "great works " have been established, contested, and creatively appropriated. Inves tigates how categories of social difference such as gender, race, and class have shaped the criteria by which works and authors have been included and excluded from dominant traditions.

Prerequisite: Eng 300 and Wr 301.

## Eng 429 - Advanced Topics in Science Fiction (4)

Study of selected topics in science fiction and speculative fiction. Topics may include the history of the field and its various movements; single-author studies; themes of sociopolitical significance; or theoretical topics. Course may be repeated forcredit with different topics. Up to 8 credits of this course number can be applied to the English major.

Also offered for graduate-level credit as Eng 529.
Prerequisite: Eng 300 and Wr 301.

## Eng 435 - Advanced Topics in Film and Media (4)

Specialized studies in the history, criticis m, or theory of film and media culture. Topics may focus on genres,
movements, figures, theoretical is sues, or ad vanced historical topics. Coursemay be repeated for credit with different topics. Up to 8 credits of this course numbercan be applied to the English major.
Also offered for graduate-level credit as Eng 535. Prerequisite: Eng 300 or Eng 304 and Wr301. (Wr 301 may be taken concurrently.).

## Eng 441 - Advanced Topics in Renaissance Literature

 (4)Study of literature of the English Renaissance (15001700), including poetry, prose, drama, and other popular forms. Topics include cultural forces such as Humanism and the Reformation, literary traditions, and historical and political contexts. Course may be repeated for credit with different topics. Up to 8 credits of this course numbercan be applied to the English major.
Also offered for graduate-level credit as Eng 541.
Prerequisite: Eng 300 and Wr 301. (Wr 301 may be taken concurrently.).

## Eng 442 - Women Writers in Global Contexts (4)

Study of the works of women writers from the postcolonial and non-Western world.
Prerequisite: Eng 300 and Wr301. (Wr301 may be taken concurrently.). Cross-Listed as: This is the same course as WS 442 and may be taken only once forcredit.

## Eng 444 - British Women Writers (4)

Study of the works of British women writers with attention to themes, styles, and characteristic concerns in the light of feminist criticism and scholarship. This is the same course as WS 444.
Also offered for graduate-level credit as Eng 544 and may be taken only once for credit. Prerequisite: Eng 300 and Wr301. (Wr 301 may be taken concurrently.).

## Eng 445 - American Women Writers (4)

Study of American women writers, with attention to themes, styles, and characteristic concerns, in the light of feminist criticism and scholarship. This is the same course as WS 445.
Also offered for graduate-level credit as Eng 545 and may be taken only once forcredit. .Prerequisite: Eng 300 and Wr301. (Wr301 may be taken concurrently.).

## Eng 447 - Major Forces in Literature (4)

A study of literary forms, theories, and movements: i.e., The Comic Novel, Literature and Theology, Southern American Women Writers. Expected preparation: 8 additional upper division Literature credits.
Also offered for graduate-level credit as Eng 547. . Prerequisite: Eng 300 and Wr 301. (Wr 301 may be taken concurrently.).

## Eng 448 - Advanced Topics: Major Figures in Literature (4)

Study of the works of one or more major authors such as Chaucer, Woolf, Coetzee, or Morris on. Course may be repeated for credit with different authors. Up to 8 credits of this course number can be applied to the English major.
Also offered for graduate-le vel credit as Eng 548. Prerequisite: Eng 300 and Wr301. (Wr301 may be taken concurrently.).

## Eng 449 - Advanced Topics in Cultural Studies (4)

Study of selected topics in contemporary culture and media, analyzing the production and reception of cultural texts through a range of interdisciplinary and theoretical approaches. Topics may include: major figures/concepts in socialtheory; politics of consumer culture; globalization and American culture. Course may be repeated for credit with different topics. Up to 8 credits of this course number can be applied to the English major.
Also offered for graduate-le vel credit as Eng 549. Prerequisite: Eng 300 and Wr301. (Wr301 may be taken concurrently.).

## Eng 450 - Advanced Topics in Eighteenth-Century Literature (4)

Study of selected topics in British poetry, prose, and drama (1660-1800). Topics may include majordevelopments (the Enlightenment, the novel, gender and literature, abolitionism, or the culture of sympathy); genres, modes, or forms; or the relation of writing to his toricalevents (slavery, revolution, colonialism, capitalism). Course may be repeated for credit with different topics. Up to 8 credits of this course numbercan be applied to the Eng lish major.
Also offered for graduate-level credit as Eng 550 .
Prerequisite: Eng 300 and Wr301. (Wr301 may be taken concurrently.).

## Eng 458 - Advanced Topics in Romanticism(4)

Study of selected as pects of Romantic literature and culture in Britain, with some attention to European Romanticism. Topics may include theories of Romanticism, poetry and poetics, the novel, the essay, autobiography, aesthetics, ecology, animals, politics, queerness, and race. Course may be repeated for credit with different topics. Up to 8 credits of this course number can be applied to the Englis h major.
Also offered for graduate-level credit as Eng 558. Prerequisite: Eng 300 and Wr301. (Wr301 may be taken concurrently.).

## Eng 460 - Advanced Topics in American Literature to 1800 (4)

Study of early American literature in the context of the history, ideas, and culture of the period. Topics focus on
writing's relationship to his torical events and movements such as European imperialism; captivity; Atlantic slavery; evangelicalism; the Enlightenment; the Revolution and national formation. Course may be repeated for credit with different topics. Up to 8 credits of this course numbercan be applied to the English major.

Also offered for graduate-level credit as Eng 560. Prerequisite: Eng 300 and Wr 301. (Wr 301 may be taken concurrently.).
Eng 461 - Topics: American Literature 1800-1900 (4)
Study of nineteenth-century American literature in the context of the history, ideas, and culture of the period. Topics may include literary movements (such as Transcendentalis $m$, sentimentalis $m$, realism); individual authors; genres, modes, or forms; or writing's relation to historical events (such as slavery and abolition, the Civil War, American imperialism, industrialization, the women's rights movement). Coursemay be repeated for credit with different topics. Up to 8 credits of this course number can be applied to the English major.
Also offered for graduate-level credit as Eng 561. Prerequisite: Eng 300 and Wr301. (Wr 301 may be taken concurrently.).

## Eng 464 - Advanced Topics in American Literature: 20th Century (4)

Study of twentieth-century American literature in the context of the history, ideas, and culture of the period. Topics may include literary movements (such as American Modernismor the HarlemRenais sance); individual authors; genres, modes, or forms; or writing's relation to historical events (such as the Cold War, Civil Rights movements, or urbanization). Course may be repeated for credit with different topics. Up to 8 credits of this course number can be applied to the English major.
Also offered for graduate-level credit as Eng 564. Prerequisite: Eng 300 and Wr 301. (Wr 301 may be taken concurrently.).
Eng 467 - Advanced Topics in American Literature and Culture (4)
Study of selected aspects of American literature and culture. Topics are unified by theme and may cover multiple historical periods. Course may be repeated for credit with different topics. Up to 8 credits of this course number can be applied to the English major.

Also offered for graduate-level credit as Eng 567. Prerequisite: Eng 300 and Wr301. (Wr 301 may be taken concurrently.).

## Eng 469 - Advanced Topics in Asian American Literature and Culture (4)

Study of selected aspects of Asian American literature and culture. Topics are unified by theme and may cover
multiple historical periods. Topics may include: Asian American and Pacific IslanderStudies; comparative and critical ethnic studies; eco-criticism and sustainability; immigration and settler colonialism. Course may be repeated forcredit with different topics. Up to 8 credits of this course numbercan be applied to the English major.

Also offered for graduate-level credit as Eng 569. Prerequisite: Eng 300 and Wr301. (Wr301 may be taken concurrently.).
Eng 475 - Advanced Topics in Victorian Literature (4)
Study of Victorian literature in the context of the history, ideas, and culture of the period. Topics include individual writers and literary movements such as pre-Raphaelitism, imperial romance, and literature of the industrial period. Course may be repeated for credit with different topics. Up to 8 credits of this course number can be applied to the English major.
Also offered for graduate-level credit as Eng 575. Prerequisite: Eng 300 and Wr 301. (Wr 301 may be taken concurrently.).

## Eng 480 - Advanced Topics in Twentieth-Century British Literature (4)

Specialized studies in twentieth-century British literature. Topics include individual writers and literary groups; poetry, prose, and fiction; theories of modernism; technology, politics, propaganda, and the arts; literature and twentieth-century philosophy. Course may be repeated for credit with different topics. Up to 8 credits of this course number can be applied to the English major.
Also offered for graduate-level credit as Eng 580. Prerequisite: Eng 300 and Wr301. (Wr301 may be taken concurrently.).

## Eng 488 - Contemporary American Poetry (4)

Study of significant trends in contemporary American poetry and poetics.
Also offered for graduate-level credit as Eng 588 and may be taken only once for credit. Prerequisite: Eng 300 and Wr301. (Wr 301 may be taken concurrently.).

## Eng 489 - Advanced Topics in Contemporary Literature (4)

Study of specialized topics in late twentieth- and early twenty-first-century literature, focusing on specific literary movements, genres and forms, or modes of cultural representation. Topics may include postcolonialism, magic realism, posthumanism, queer theory, or digital/electronic literary forms. Course may be repeated for credit with different topics for up to 8 credits. Up to 8 credits of this course number can be applied to the English major

Prerequisite: Eng 300 and Wr301. (Wr301 may be taken concurrently.).

## Eng 490 - Advanced Topics in Rhetoric (4)

Advanced study of rhetorical theory and practice, with focus on ideology, identity, and public discourse. Students will develop and pursue research projects according to their interests. Course may be repeated for credit with different topics for up to 8 credits. Up to 8 credits of this course number can be applied to the English major.
Also offered for graduate-level credit as Eng 590.
Prerequisite: Eng 300 and Wr301. (Wr 301 may be taken concurrently.).

## Eng 491 - History of Literary Criticismand Theory I

 (4)Historical survey of significant works in the Western critical and philos ophical tradition fromancient Greece to the nineteenth century, with a focus on fundamental questions about literary composition, aesthetic judgment, and the nature and function of literature.
Also offered for graduate-level credit as Eng 591 and may be taken only once for credit. Prerequisite: Eng 300 and Wr301. (Wr301 may be taken concurrently.).

Eng 492 - History of Literary Criticismand Theory II (4)

Historical survey of significant works in the Western critical and philos ophical tradition fromMarxis $m$ to poststructuralism.
Also offered for graduate-level credit as Eng 592 and may be taken only once for credit. Prerequisite: Eng 300 and Wr301. (Wr301 may be taken concurrently.).

## Eng 494-Topics in Critical Theory and Methods (4)

Specialized study of important and influential strands in critical theory such as Marxism, ps ychoanalysis, feminism, postcolonialism, queer theory, and others. Course may be repeated forcredit with different topics. Up to 8 credits of this course number can be applied to the English major.
Also offered for graduate-level credit as Eng 594.
Prerequisite: Eng 300 and Wr301. (Wr 301 may be taken concurrently.).

## Eng 496-Comics Theory (4)

Focus on various critical approaches to comics, exploring interdisciplinary theories and methods and applying these theories to primary texts.
Also offered for graduate-level credit as Eng 596 and may be taken only once for credit. Prerequisite: Eng 300 and Wr301. (Wr301 may be taken concurrently.).

## Eng 497 - Comics History (4)

Study of comics art as a mediumof visual narrative and its evolution through the history of the American comics industry. Topics include the diversity of comics and their
storytelling power by investig ating the distinctive qualities of seminal texts, their origins and precedents, their relationships to particular cultural moments, and their potential as inspiration and influence on later comics art.
Also offered for graduate-level credit as 597 and may be taken only once for credit. Prerequisite: Eng 300 and Wr 301. (Wr301 may be taken concurrently.).

## Eng 498 - Ecology, Criticism, and Culture (4)

Examines ecological perspectives on the study of literature, culture, and critical theory as well as the useof literary analysis and cultural studies to illuminate environmentalissues and problems of sustainability.
Also offered for graduate-level credit as Eng 598 and may be taken only once for credit. Prerequisite: Eng 300 and Wr301. (Wr301 may be taken concurrently.).

## Eng 500 - Problems and Methods (4)

Required of all Eng lish M.A. students, ENG 500 introduces students to methods of analysis, interpretation, and research. Students take the course in the fall quarter of their first year of study.

## Eng 501 - Research (0-12)

See department for course description. (Credit to be arranged.)

## Eng 502 - Independent Study (1-6)

(Credit to be arranged.)

## Eng 504-Cooperative Education/Internship (0-9)

See department for course description. (Credit to be arranged.)

## Eng 505 - Reading and Conference (0-9)

Consentof instructor. See department for course description. (Credit to be arranged.)

## Eng 506-Projects (1-9)

(Credit to be arranged.)

## Eng 507 -Seminar (1-6)

Variable topics. Graduate only or consent of instructor. At least one Eng 507 seminar is required of M.A. candidates in English. (Credit to be arranged.)

## Eng 508 - Workshop(0-6)

See department for course description. (Credit to be arranged.)

## Eng 509 - Practicum(0-9)

See department for course description. (Credit to be arranged.)

## Eng 510 -SelectedTopics (1-6)

See department for course description. (Credit to be arranged.)

## Eng 511 - English Drama (4)

Study of important trends, traditions, and movements in English drama, examining drama both as a literary genre and as a complex mix of performance, spectatorship, cultural context, and theater his tory. Topics may be drawn from a range of his torical periods, frommedievaldrama to the present day.
Also offered for undergraduate-level credit as Eng 411 and may be taken only once for credit. . Prerequisite: Eng 300.

## Eng 513 - Teaching and Tutoring Writing (4)

Study and practice of writing instruction in various contexts, with focus on process, evaluation, and feed back.
Also offered for undergraduate-levelcredit as Eng 413 and may be taken only once for credit. .

## Eng 514 - Composition Theory (4)

Survey of composition theory, including rhetoric, cognition, pedagogy, and research across literacy contexts. Students will develop and pursue research projects according to their interests.
Also offered for undergraduate-levelcredit as Eng 414 and may be taken only once for credit. .

## Eng 515 - Res earch Methods in Rhetoric and Composition (4)

Study and practice of empirical and ethnographic methodologies, with focus on epistemology, ethics, and representation. Students will develop and pursue research projects according to their interests.
Also offered for undergraduate-level credit as Eng 415 and may be taken only once for credit. .

## Eng 516 - History of Rhetoric (4)

Survey of rhetorical theory and practice fromclassical through contemporary contexts. Students will develop and pursueresearch projects according to their interests.

Also offered for undergraduate-level credit as Eng 416 and may be taken only once forcredit. .

## Eng 517 - Middle English (4)

Introduction to Middle English language through study of (largely non-Chaucerian) 12th to 15th century literature in the original. Graduate only or consent of instructor.

## Eng 518 - College Composition Teaching (1)

Introduces and develops the theoretical and practical expertise of the graduateteaching assistant in the area of college composition teaching. May be taken up to three times for credit.
Prerequisite: appointment to teaching as sistantship in English Department.

## Eng 519 - Advanced College Composition Teaching (1)

Continues the development of the theoretical and practical expertise of the graduate teaching assistant in advanced areas of college composition teaching. May be repeated up to three times for credit. Required prerequisite: appointment to 2nd year teaching assistantship in Eng lish Department.

## Eng 520 - Caribbean Literature (4)

Study of important works and writers fromacross the Caribbean basin with an emphasis on understanding the historical and theoretical contexts of literary production, the cultural legacies of colonialis $m$, and the linguistic innovations particular to the region.
Also offered for undergraduate-level credit as Eng 420 and may be taken only once for credit. .

## Eng 522 - African Fiction (4)

Study of literary and cultural production fromthe African continent, focusing on topics such as colonialism, national liberation, globalization, gender, and the relationship between art and politics. Includes some consideration of the question of language and the appropriation of Western literary conventions.
Also offered for undergraduate-level credit as Eng 422 and may be taken only once for credit. .
Eng 525 - Practical Grammar (4)
Designed to enable students to understand, and therefore consciously to make effective, the structures of their written sentences. The course examines grammatical categories, structures, and terminology; relationships between grammatical structures and punctuation; and prescriptive grammars for written texts. Expected preparation: 4 upper divis ionLiterature/Writing credits.

## Eng 526 - Advanced Topics in Medieval Literature (4)

Study of Medieval Eng lish literature (c. 800-1500), including Anglo-Saxon works, continental vernacular and Latin medieval writing, and the Middle English vernacular tradition. Students will have some opportunity to learn to read Old and Middle English. Course may be repeated for credit with different topics. Up to 8 credits of this course number can be applied to the English major.
Also offered for undergraduate-level credit as Eng 426. . Prerequisite: Eng 300.

## Eng 529 - Advanced Topics in Science Fiction (4)

Study of selected topics in science fiction and speculative fiction. Topics may include the history of the field and its various movements; single-author studies; themes of sociopolitical significance; or theoretical topics. Course may be repeated for up to 8 credits with different topics.
Also offered for undergraduate-level credit as Eng 429. Prerequisite: Graduatestanding.

## Eng 530 -Sixteenth Century Literature (4)

Specialized studies in Renaissance English literature. Topics include individual writers and literary groups; sixteenth-century poetry and prose; the English sonnet; the Renais sance epic and pastoral traditions; Elizabethan drama, verse narrative, s atire, and invective; humanism; the rise of the profes sional writer; literature and the visual arts. Expected preparation: Eng 341 U and 4 additional upperdivisionLiterature credits
Prerequisite: Eng 300.

## Eng 531 - Topics in English Studies (1)

Examines various theories, history, scholarship, pedagogy, and professional development in the field of English Studies. Topics always differ each term. May be repeated for up to six credits.

## Eng 532 - Old English (4)

An introduction to the history and grammar of Old English. This is the first course in a sequence of three: Eng 532, Eng 533, and Eng 534. Recommended prerequisite: Eng 532 is prerequisite for Eng 533 or 534. Graduate only or consent of instructor.

## Eng 533 - Old English (4)

An introduction to the history and grammar of Old English. This is the second course in a sequence of three: Eng 532, Eng 533, and Eng 534. Recommended prerequisite: Eng 532 is prerequisite for Eng 533 or 534. Graduate only or consent of instructor.

## Eng 534 - Old English (4)

An introduction to the history and grammar of Old English. This is the third course in a sequence of three: Eng 532, Eng 533, and Eng 534. Recommended prerequisite: Eng 532 is prerequisitefor Eng 533 or 534 . Graduate only or consent of ins tructor.

## Eng 535 - Advanced Topics in Film and Media (4)

Specialized studies in the history, criticis m, or theory of film and media culture. Topics may focus on genres, movements, figures, theoretical issues, or advanced historical topics. Course may be repeated for credit with different topics. Up to 8 credits of this course numbercan be applied to the English major.

Also offered for undergraduate credit as Eng 435.

## Eng 540 - Advanced Topics in Seventeenth Century Literature (4)

Specialized studies in seventeenth-century literature. Topics include cavalier and metaphysical poetry; revenge tragedy; prose forms of the early seventeenth century; popular genres of the English civil war; women writers; and restoration drama. Expected preparation: Eng 341U or Eng 342U and 4 additional upper division Literature credits.
Prerequisite: Eng 300.
Eng 541 - Advanced Topics in Renaissance Literature (4)

Study of literature of the English Renaissance (15001700), including poetry, prose, drama, and other popular forms. Topics includecultural forces such as Humanism and the Reformation, literary traditions, and historical and political contexts. Course may be repeated for credit with different topics. Up to 8 credits of this course number can be applied to the English major.

Also offered for undergraduate-level credit as Eng 441. Prerequis ite: Eng 300.

## Eng 544 - British Women Writers (4)

Study of the works of British women writers with attention to themes, styles, and characteristic concerns in the light of feminist criticism and scholarship.
Also offered for undergraduate-level credit as Eng 444 and may be taken only once for credit. . Prerequisite: Eng 300.

## Eng 545 - American Women Writers (4)

Study of American women writers, with attention to themes, styles, and characteristic concerns, in the light of feminist criticism and scholarship.

Also offered for undergraduate-levelcredit as Eng 445 and may be taken only once for credit. . Prerequisite: Eng 300.

## Eng 547 - Major Forces in Literature (4)

A study of literary forms, theories, and movements: i.e., The Comic Novel, Literature and Theology, Southern American Women Writers. Expected preparation: 8 additional upper division Literature credits.

Also offered for undergraduate-level credit as Eng 447. . Prerequisite: Eng 300.

## Eng 548 - Advanced Topics: Major Figures in Literature (4)

Study of the works of one or more major authors such as Chaucer, Woolf, Coetzee, or Morris on. Course may be repeated forcredit with different authors. Up to 8 credits of this course number can be applied to the English major.

Also offered for undergraduate-levelcredit as Eng 448. . Prerequisite: Eng 300.

## Eng 549 - Advanced Topics in Cultural Studies (4)

Study of selected topics in contemporary culture and media, analyzing the production and reception of cultural texts through a range of interdisciplinary and theoretical approaches. Topics may include: major figures/concepts in social theory; politics of consumer culture; globalization and American culture. Course may be repeated for credit with different topics. Up to 8 credits of this course number can be applied to the English major.
Also offered for undergraduate-levelcredit as Eng 449. . Prerequisite: Eng 300.

## Eng 550 - Advanced Topics in Eighteenth-Century Literature (4)

Study of selected topics in British poetry, prose, and drama (1660-1800). Topics may include major developments (the Enlightenment, the novel, gender and literature, abolitionis m , or the culture of sympathy); genres, modes, or forms; or the relation of writing to historical events (slavery, revolution, colonialis m, capitalism). Course may be repeated for credit with different topics. Up to 8 credits of this course number can be applied to the English major.
Also offered for undergraduate-level credit as Eng 450. . Prerequisite: Eng 300.

## Eng 558 - Advanced Topics in Romanticism (4)

Study of selected aspects of Romantic literature and culture in Britain, with some attention to European Romanticism. Topics may include theories of Romanticism, poetry and poetics, the novel, the essay, autobiography, aesthetics, ecology, animals, politics, queerness, and race. Course may be repeated forcredit with different topics. Up to 8 credits of this course number can be applied to the English major.

Also offered for undergraduate-level credit as Eng 458. . Prerequisite: Eng 300.

Eng 560 - Advanced Topics in American Literature to 1800 (4)

Study of early American literature in the context of the history, ideas, and culture of the period. Topics focus on writing's relationship to his torical events and movements such as European imperialism; captivity; Atlantic slavery; evangelicalism; the Enlightenment; the Revolution and national formation. Course may be repeated for credit with different topics. Up to 8 credits of this course number can be applied to the English major.
Also offered for undergraduate-level credit as Eng 460. . Prerequisite: Eng 300.

## Eng 561 - Topics: American Literature 1800-1900 (4)

Study of nineteenth-century American literature in the context of the history, ideas, and culture of the period. Topics may include literary movements (such as Transcendentalis $m$, sentimentalis $m$, realism); individual authors; genres, modes, or forms; or writing's relation to historical events (such as slavery and abolition, the Civil War, American imperialism, industrialization, the women's rights movement). Course may be repeated for credit with different topics. Up to 8 credits of this course number can be applied to the English major.
Also offered for undergraduate-level credit as Eng 461.. Prerequisite: Eng 300.

## Eng 564 - Advanced Topics in American Literature: 20th Century (4)

Study of twentieth-century American literature in the context of the history, ideas, and culture of the period. Topics may include literary movements (such as American Modernismor the HarlemRenais s ance); individual authors; genres, modes, or forms; or writing's relation to historical events (theCold War, Civil Rights movements, or urbanization). Course may be repeated for credit with different topics. Up to 8 credits of this course numbercan be applied to the English major.
Also offered for undergraduate-level credit as Eng 464. .
Prerequisite: Eng 300.
Eng 567 - Advanced Topics in American Literature and Culture (4)

Study of selected as pects of American literature and culture. Topics are unified by theme and may cover multiple historical periods. Course may be repeated for credit with different topics. Up to 8 credits of this course number can be applied to the Englis $h$ major.
Also offered for undergraduate-level credit as Eng 467. . Prerequisite: Eng 300.

## Eng 568-American Literature and Culture (4)

Studies based on primary sources of American literature and culture fromEuropean contact to the present. The approach is thematic rather than chronological. Recommended prerequis ite: 12 credits in literature.

## Eng 569 - Advanced Topics in Asian American Literature and Culture (4)

Study of selected aspects of Asian American literature and culture. Topics are unified by theme and may cover multiple historical periods. Topics may include: Asian American and Pacific IslanderStudies;comparative and critical ethnic studies; eco-criticismand sustainability; immigration and settler colonialism. Course may be repeated forcredit with different topics. Up to 8 credits of this course number can be applied to the English major.
Also offered for undergraduate-level credit as Eng 469.. Prerequisite: Eng 300. Expected preparation: Eng 369U and 4 additional upper division Literature credits.
Eng 575-Advanced Topics in Victorian Literature (4)
Study of Victorian literature in the context of the history, ideas, and culture of the period. Topics include individual writers and literary movements such as pre-Raphaelitism, imperial romance, and literature of the industrial period. Course may be repeated forcredit with different topics. Up to 8 credits of this course number can be applied to the English major.

Also offered for undergraduate-levelcredit as Eng 475. . Prerequisite: Eng 300.

## Eng 580 - Advanced Topics in Twentieth-Century British Literature (4)

Specialized studies in twentieth-century British literature. Topics include individual writers and literary groups; poetry, prose, and fiction; theories of modernism; technology, politics, propaganda, and the arts; literature and twentieth-century philosophy. Course may be repeated for credit with different topics. Up to 8 credits of this course number can be applied to the English major.
Also offered for undergraduate-levelcredit as Eng 480. . Prerequisite: Eng 300.

## Eng 584-Modern Drama (4)

Examines major European, English, and American plays in the period 1880-1940. Expected preparation: 8 additional upper divisionLiterature credits.
Prerequisite: Eng 300.

## Eng 585 - Contemporary Drama (4)

Examines major developments in world drama since World War II. Expected preparation: 8 additional upper division Literature credits.
Prerequisite: Eng 300.
Eng 586 - Contemporary American Novel (4)
American novelsince 1965, with emphas is upontraditions, themes and trends. Expected preparation: 8 additional upperdivisionLiterature credits.
Prerequisite: Eng 300.
Eng 587 - Contemporary American Short Story (4)
The American short story frommid-20th century to the present. Expected preparation: 8 additional upper division Literature credits.

Prerequisite: Eng 300.

## Eng 588 - Contemporary American Poetry (4)

Study of significant trends in contemporary American poetry and poetics.
Also offered for undergraduate-level credit as Eng 488 and may be taken only once for credit. . Prerequisite: Eng 300 .

## Eng 590 - Advanced Topics in Rhetoric (4)

Advanced study of rhetorical theory and practice, with focus on ideology, identity, and public dis course. Students will develop and pursue research projects according to their interests. Course may be repeated for credit with different topics for up to 8 credits. Up to 8 credits of this course number can be applied to the English major.
Also offered for undergraduate-level credit as Eng 490. .
Eng 591 - History of Literary Criticismand Theory I (4)

Historical survey of significant works in the Western critical and philos ophicaltradition fromancient Greece to the nineteenth century, with a focus on fundamental ques tions about literary composition, aesthetic judgment, and the nature and function of literature.
Also offered for undergraduate-level credit as Eng 491 and may be taken only once for credit.

## Eng 592 - History of Literary Criticismand Theory II (4)

Historical survey of significant works in the Western critical and philosophical tradition fromMarxism to poststructuralism.
Also offered for undergraduate-level credit as Eng 492 and may be taken only once for credit. . Prerequisite: Eng 300 .

## Eng 593 - Advanced Topics in FeministLiterary

## Theory (4)

Provides in-depth study of specific critical schools within the larger arena of feminist theory. Pos sible topics will include post colonialismand feminis $m$; feminis $m$ and the body; historical perspectives on feminism. Course may be repeated forcredit with different topics. Expected preparation: Eng 492 and 4 additional upper division Literature credits.
Prerequisite: Eng 300.
Eng 594-Topics in Critical Theory and Methods (4)
Specialized study of important and influential strands in critical theory such as Marxism, psychoanalysis, feminism, postcolonialism, queer theory, and others. Course may be repeated forcredit with different topics. Up to 8 credits of this course number can be applied to the English major.
Also offered for undergraduate-level credit as Eng 494. . Prerequisite: Eng 300.

## Eng 595 - Contemporary Critical Theory (4)

Literary criticism in theory and practice in the 20th century. Graduate only or consent of ins tructor.

## Eng 596-Comics Theory (4)

Focus on various critical approaches to comics, exploring interdisciplinary theories and methods and applying these theories to primary texts.
Also offered for undergraduate-level credit as Eng 496 and may be taken only once for credit. Prerequisite: Upperdivision standing.

## Eng 597 - Comics History (4)

Study of comics art as a medium of visual narrative and its evolution through the history of the American comics industry. Topics include the diversity of comics and their storytelling power by investigating the distinctive qualities of seminal texts, their origins and precedents, their relationships to particular cultural moments, and their potential as ins piration and influence on later comics art.
Also offered for undergraduate-levelcredit as 497 and may be taken only once for credit.

## Eng 598 - Ecology, Criticism, and Culture (4)

Examines ecological perspectives on the study of literature, culture, and critical theory as well as the useof literary analys is and cultural studies to illuminate environmental issues and problems of sustainability.
Also offered for undergraduate-level credit as Eng 498 and may be taken only once for credit. . Prerequisite: Eng 300.

## EnvE - Environmental Engineering

## EnvE 365 -Physical Environmental Processes (2)

Engineering physics of environmental processes and systemdy namics. Relates to separate laboratory course using quantitative techniques for conceptualizing and analyzing movement of energy and material at local and global scales. Co-requisite: EnvE368. Expected preparation: Admission to EnvEUpper Division.

Prerequisite: Ch 222/Ch 228, Ph 213/Ph 216, Mth 256. Corequisite: EnvE368.

## EnvE 366 - Analytical Methods in Environmental Engineering (2)

Theory and analytical techniques for as sessment of water quality properties important in environmental engineering. Co-requisite: ENVE 369.
Prerequisite: Ch 222/Ch 228, Ph 223 (or Ph 213 )/Ph 216, MTH 256. Corequisite: EnvE369.

## EnvE 368 -Physical Environmental Process Lab(2)

Laboratory and field exercises to accompany Physical Environmental Processes (EnvE365). Requires concurrent enrollment in EnvE 365.

Prerequisite: Ch 222/Ch 228, Ph 223 (Ph 213) /Ph 216, Mth 256. Corequisite: EnvE365.

## EnvE 369 - Analytical Methods in Environmental Engineering Lab (2)

Laboratory and field exercises to accompany Analytical Methods in Environmental Engineering (EnvE366). Requires concurrentenrollment in EnvE366.
Prerequisite: Ch 222/Ch 228, Ph 223 (Ph 213)/Ph 216, Mth 256. Corequisite: EnvE366.

EnvE 370 -Sampling, Analysis and Risk Assessment for Environmental Engineering Lab (2)
Synthesis of analytical chemis try and water quality knowledge. Laboratory and field exercises to implement water quality assessment project. Interpretation and presentation of project results.
Prerequisite: EnvE366, EnvE 369.

## EPI - Epidemiology

Courses offered as part of the joint OHSU-PSU School of Public Health.

## Epi 512 - Epidemiology I (4)

Epidemiology I introduces the concepts, principles and methods of epidemiology to graduate students in the School of Public Health. Epidemiology is one of the fundamental sciences used by public health professionals to identify, prevent and control health problems in
communities.Specifically, epidemiologic methods are used to investigate the distribution of health-related states or events (e.g. disease, health conditions, etc.) in populations and identify the factors or characteristics that influence or determine these dis tributions. In addition, epidemiology is used to aide in the implementation and evaluation of public health programs and policies designed to control or ameliorate health problems in populations. In this course, students will learn how to apply epidemiological methods to address questions about the distribution of dis ease, death, dis ability and risk exposures in populations, as well as those relating to causal as sociations between exposures and health outcomes.
Also offered as Epi 612 and may be taken only once for credit.

## Epi 513 - Epidemiology II (4)

This course is the second in a three-coursesequence designed for the MPH Epidemiology and Biostatistics majors. Students will develop skills in recognizing strengths and weaknesses of various epidemiological study designs, describing sources of bias that can distort measures of effect/association, and designing case-control studies, cohort studies, and randomized clinical trials. The class will also explore additional study designs used less frequently, such as nested case-control studies and casecrossover studies. Students will gain experience in recognizing andevaluating the roles of bias, confounding, and interaction (effect modification) in data derived from epidemiologicalstudies. Problem-solving exercises will focus on study designs and analysis. Written homework assignments and problem-oriented learning will occupy a central role in facilitating mastery of epidemiologic methods and is sues.
Also offered as Epi613. Prerequisite: Epi 512 and Bsta 525.

## Epi 514 -Epidemiology III (4)

Will address the amount and types of data needed to establish and defend ideas of causation of community health problems. Will illustrate how data are most effectively translated into health agency policy, public testimony, and/or legislated regulation. Teaching will emphasize the problem-oriented seminar method.
Also offered as Epi 614. Prerequisite:Epi512 and Bsta 525.

## Epi 521 -Injury and Violence Prevention (3)

This course introduces students to the causes and consequences of traumatic injury and violence and the public health approach to injury and violence prevention. Conceptual frameworks that consider behavioral and environmental approaches to injury prevention will be discussed as well as the upstreamsocio-economic underpinnings of injury and violence causation. EPI 521 is primarily designed forstudents in a Master's in Public

Health (MPH) program, in EPI or related field, in the OHSU-PSU School of Public Health. EPI 621 is designed for PhD students fromEPI or other related PhD program.
Also offered for doctoral students as Epi 621 and may be taken only once for credit.

## Epi 536 - Epidemiological Data Analysis \& Interpretation (4)

Students will apply epidemiologic and biostatistical principles to the analysis of National Health and Nutritional Examination Survey (NHANES) data. Hypotheses are formulated based on the NHANES variables and a brief literature review of the public health need for the research. Students work in pairs to plan, org anize, and conduct analyses leading to final oral and written presentations of their findings. Class time allows for hands-on experience with data quality assessment, preparation of datasets and variables for analysis, and multivariable modeling. Emphasis is on planning and communicating analytic plans that reflect thecausal models generated by students and allow for assessment of confounding and interaction (effect measure modification).
Also offered as Epi 636. Prerequisite:Epi512, Epi 513, Epi 514, Bsta 525, Bsta 512, and Bsta 513.

## Epi 540 - Introduction to Research Proposal and Design (3)

This course provides an introduction to research design and proposal writing. It builds upon concepts of epidemiology and biostatis tics to enable students to develop a study plan to conduct public health research that is efficient, effective, and ethical. Writing a research proposal is a skill necessary in the professional practice of public health. During this course, students will prepare a written proposal that includes a concise statement of the epidemiologic research question, testable hypotheses, appropriate specific aims, and a plan of work. Students will learn how to formulate a logical argument to establish the significance of theirquestion and to defend their approach. All of the elements of the study plan will be developed, including choice of design, sample size and power, sampling design and recruitment of subjects, measurement of predictor and outcome variables, controlof bias and confounding, and statistical analysis. Limited time will be spent on an introduction to budget development and project management. The major product of the course is the completion of a research proposal, which will be prepared according to the submis sion requirements of a federal funding agency. The instructors will review written work with each student during the term to ensure that all required elements are included in the application.

Also offered as Epi 640 and may be taken only once for credit. Prerequisite: Epi512.

## Epi 556 -HIV/AIDS Epidemiology (3)

The course will start with a review of the known characteristics and pathology of the human immunodeficiency virus infection and pathogenesis of the clinical acquired immunodeficiency syndrome. Biological and behavioral factors that determine the risks of trans mis sion of the HIV infection will be emphasized and public health prevention strategies will be evaluated. The globalHIV epidemic will be considered along with the impact of HIV infection on vulnerable populations, especially women and children. Ethical factors and the impact of stigma will be discussed.
Prerequisite: Epi 512 and Bsta 525.

## Epi 566 - Current Issues in Public Health (2)

This is a core course for students in the Epidemiology and Biostatistics track of the OHSU-PSU School of Public Health MPH program. It is designed to introducestudents to public health in a seminar-style (presentation and discussion) exploration of the basic principles, structures, and functions of public health, and selected important is sues of public health relevance. The course also addresses competencies in public health communication for diverse audiences through a variety of exercises using different communication strategies. Public health and preventive medicine professionals fromOHSU, PSU, the School of Public Health, and the community will present and facilitate dis cussions of their work and perspectives related to these public health topics and is sues.

## Epi 567 - Global Health Epidemiology (3)

This elective course is intended to broaden students' understanding of the field of applied epidemiology through the context of a global perspective. Although offered to Masters Level, MPH students, other health professions students often register. Global Health Epidemiology is a required course for students enrolled in the Concentration in Global Health Studies Programfor epidemiology students.
Prerequisite: Introductory epidemiology and biostatistics courses.

## Epi 568 - Infectious Disease Epidemiology (2)

This course provides an introduction to infectious epidemiology, and includes fundamental topics such as outbreak investigation, public health communicable dis ease surveillance and reporting, biological concepts of diseaseintroduction, evolution and spread, and design of population-based studies to valuate features of infectious diseases (e.g., risk factors, method of spread, clinical features, disease prevalence). This course will also introduce some of the categories of communicable diseases and highlight some features of the major diseases within each category. It builds upon concepts of epidemiology
(e.g., risk/odds ratio, case-control and cohort studies, statistical significance) to provide students with a strong understanding of infectious disease concepts and methods such as conducting an outbreak investigation.
Also offered as Epi 668 and may be taken only once for credit. Prerequisite: Epi 512 and Bsta 512.

## Epi 576 - Chronic Disease Epidemiology (2)

This course is designed for MPH Epidemiology and MPH and MS Biostatistics programmajors, as well as PhD candidates in Epidemiology. The course is intended to give students an understanding of the epidemiology of major chronic diseases in developed countries. It covers three as pects of chronic disease: 1) epidemiology methods used in their study, 2) epidemiologic findings and current status of epidemiologic research into various chronic dis eases, and 3) the epidemiology of the major risk factors for chronic diseases. The course is based on presentations by researchers and public health practitioner experts on specific chronic disease topics. Students will gain familiarity with some of the important epidemiologic studies and study innovations that have contributed to our knowledge of chronic diseases and their control.

Also offered as Epi 676 and may be taken only once for credit. Prerequis ite: Epi 512.

## Epi 603 - Disssertation (1-12)

(Credit to be arranged.)

## Epi 610 - Epidemiology Doctoral Seminar (3)

This advanced doctoral-level course synthesizes across students' prior training in epidemiology, biostatistics, applied research, and the disciplines/content areas that are required for students' doctoral research. Building on this foundation, and drawing fromdoctoral students' and the instructor's expertise, this course aims to facilitate the intellectual development required to conduct and present original epidemiologic research.
Prerequisite: Graduate training in epidemiologic methods and biostatistics. Epi 512, Epi 513, Epi 514, (Bsta 514 or Bsta 519), and Bsta 612.

## Epi 611 - Epidemiology Doctoral Seminar II (2)

This advanced doctoral-level course synthesizes across students' prior training in epidemiology, biostatistics, applied research, and the disciplines/content areas that are required for students' doctoral research. Building on this foundation, and drawing fromdoctoral students' and the instructor's expertise, this course aims to facilitate the intellectual development required to conduct and present original epidemiologic research.

Prerequisite: Epi 610.

## Epi 612 -Epidemiology I (4)

Epidemiology I introduces the concepts, principles and methods of epidemiology to graduate students in the School of Public Health. Epidemiology is one of the fundamental sciences used by public health professionals to identify, prevent and control health problems in communities. Specifically, epidemiologic methods are used to investigate the distribution of health-related states or events (e.g. dis ease, health conditions, etc.) in populations and identify the factors or characteristics that influence or determine these dis tributions. In addition, epidemiology is used to aide in the implementation and evaluation of public health programs and policies designed to control or ameliorate health problems in populations. In this course, students will learn how to apply epidemiologicalmethods to address questions about the distribution of disease, death, disability and risk exposures in populations, as well as those relating to causal as sociations between exposures and health outcomes.
Also offered as Epi 512 and may be taken only once for credit.

## Epi 613 - Epidemiology II (4)

This course is the second in a three-coursesequence designed for the MPH Epidemiology and Biostatistics majors. Students will develop skills in recognizing strengths and weaknesses of various epidemiological study designs, describing sources of bias that can distort measures of effect/association, and designing case-control studies, cohort studies, and randomized clinical trials. The class will also explore additional study designs used less frequently, such as nested case-control studies and casecrossover studies. Students will gain experience in recognizing and evaluating the roles of bias, confounding, and interaction (effect modification) in data derived from epidemiologicalstudies. Problem-solving exercises will focus on study designs and analy sis. Written homework as signments and problem-oriented learning will occupy a central role in facilitating mastery of epidemiologic methods and is sues.

Also offered as Epi 513. Prerequisite: Epi 612 and Bsta 525.

## Epi 614 -Epidemiology III (4)

Will address the amount and types of data needed to establish and defend ideas of causation of community health problems. Will illustrate how data are most effectively translated into health agency policy, public testimony, and/or legislated regulation. Teaching will emphasize the problem-oriented seminar method.
Also offered as Epi 514. Prerequisite: Epi 613 and Bsta 525.

## Epi 621 - Injury and Violence Prevention (3)

This course introduces students to the causes and consequences of traumatic injury and violence and the public health approach to injury and violence prevention. Conceptual frameworks that consider behavioral and environmental approaches to injury prevention will be discussed as well as the upstream socio-economic underpinnings of injury and violence causation. EPI521 is primarily designed for students in a Master's in Public Health (MPH) program, in EPI or related field, in the OHSU-PSU School of Public Health. EPI 621 is designed for PhD students fromEPI or other related PhD program.
Also offered for graduate-level credit as Epi521 and may be taken only once for credit.

## Epi 630 - Epidemiology Journal Club (1)

This is an elective course for epidemiology track masters students. Doctoral students are required to register for at least two terms (one credit each) during the first two years of their program. This course is intended to extend students' understanding of the fields of epidemiology and public health research, and their ability to explore and critique research methods. In weekly ses sions, the instructor, guest faculty, and students will prepare a peerreviewed article for class discussion that demonstrates or involves innovative public health content or methods. A secondary goal of this class is to preparestudents to performpeer-review thems elves (e.g., for journals, study sections) by examples of this work fromfaculty.

## Epi 636 - Epidemiological Data Analysis \& Interpretation (4)

Students will apply epidemiologic and biostatistical principles to the analysis of National Health and Nutritional Examination Survey (NHANES) data. Hypotheses are formulated based on the NHANES variables and a brief literature review of the public health need for the research. Students work in pairs to plan, organize, and conduct analy ses leading to finaloral and written presentations of their findings. Class time allows for hands-on experience with dataquality assessment, preparation of datasets and variables for analysis, and multivariable modeling. Emphasis is on planning and communicating analytic plans that reflect thecausal models generated by students and allow for as sessment of confounding and interaction (effect measure modification).
Also offered as Epi 536. Prerequisite: Epi 613, Epi 614, Bsta 612, Bsta 613, and Bsta 515.

## Epi 640 - Research Proposal and Design (3)

Provides an introduction to research design and proposal writing. It builds upon concepts of epidemiology and biostatistics to enable students to develop a study plan to conduct public health research that is efficient, effective,
and ethical. Writing a research proposal is a skill neces sary in the professional practice of public health. During this course, students will prepare a written proposal that includes a concise statement of the epidemiologic research question, testable hypotheses, appropriate s pecific aims, and a plan of work.

Also offered as Epi 540 and may be taken only once for credit. Prerequisite: Epi 612.

## Epi 650 -Mentored Epidemiology Research (2-4)

This course is based on moving the skill set of prior epidemiologic methods, research, and biostatistical courses into a deeper contemplation and synthesis across methods and theories in epidemiology.

## Epi 660 -Mentored Epidemiology Teaching (1)

This course is intended to provide a guided, mentored teaching experience for doctoral students in Epidemiology. In addition to typical and course-specific teaching assis tant (TA) duties that support the teaching faculty member/course instructor, PhD epidemiology graduates will be provided basic-level preparation for independent teaching. Each TA is expected to performsome or all of the following duties: 1. Prepare for and hold office hours for student enrolled in the course they have been assigned to, 2. Support on-line (Sakai) teaching website for the course, if needed for the course (students must complete a TA confidentiality formfor these Sakai activities and submit to the OHSU Teaching and Learning Center). 3. Support the development and dis tribution of course materials for students and the instructor. 4. Support the evaluation of students' assigned work, including homework, quizzes and tests, termpapers, s mall group activities, computer-lab assignments, etc. 5. Prepare and deliver one or more course sessions under the supervisor of the faculty/course instructor mentor.

## Epi 668 - Infectious Disease Epidemiology (2)

Provides an introduction to infectious epidemiology, and includes fundamentaltopics such as outbreak investigation, public health communicable disease surveillance and reporting, biological concepts of disease introduction, evolution and spread, and design of population-based studies to evaluate features of infectious diseases (e.g., risk factors, method of s pread, clinical features, disease prevalence). Will also introduce some of the categories of communicable diseases and highlight some features of the major diseases within each category.

Also offered as Epi 568 and may be taken only once for credit. Prerequisite: Epi512 and Bsta 512.

## Epi 676 - Chronic Disease Epidemiology (2)

Gives students an understanding of the epidemiology of major chronic diseases in developed countries. It covers three as pects of chronic disease: 1) epidemiology methods used in their study, 2) epidemiologic findings and current status of epidemiologic research into various chronic diseases, and 3) the epidemiology of the major risk factors for chronic dis eases. The course is based on presentations by researchers and public health practitioner experts on specific chronic disease topics.

Also offered as Epi 576 and may be taken only once for credit. Prerequisite: Epi 612.

## ESHH - Environmental Systems and Human Health

Courses offered as part of the joint OHSU-PSU School of Public Health.

## ESHH 506 -Special Projects (1-12)

(Credit to be arranged.)

## ESHH 511 - Concepts of Environmental Health (3)

An intensive course designed to familiarize students with fundamentals of environmental health froma scientific and conceptual perspective. Topics are considered within multi-caus al, ecological, adaptive systems, and riskassessment frameworks. Includes consideration of biological, chemical, and physicalagents in the environment, which influence public health and wellbeing. Recommended prerequisite: graduate standing.
Also offered as ESHH 611.

## ESHH 512 - Global \& Planetary Health Concepts (3)

Provides an introduction to Global and Planetary Health. It will focus on the factors that make public health a priority at regional and global scales. It will also address the underlying processes that determine public health in a range of regional settings.
Also offered as ESHH 612 for doctoral students and may be taken only once for credit.

## ESHH 519 -Environmental Health in a Changing World (3)

Human health is profoundly affected by the environment in many complex ways. This complexity is further compounded by global climate changes currently taking place. The impacts both now and in the future are likely to include: increased frequency of extreme weather (heat waves, flooding, drought); degraded air and water quality; the spread and/or re-emergence of vector-borne diseases; changes in food safety and food security; and population displacement or civil unrest. The severity of impacts and
the affect on burden of disease depends on proactive public health policy and planning at local, national and global scales. This course will provide a basis for understanding why, how and when climate change becomes a public health concern and explore mitigation and adaptation strategies to improve human health and well-being in the future.

## ESHH 521 - Principles of Occupational Health (4)

Occupational Health students will learn about the current Total Worker Health ${ }^{\circledR}$ approach to creating safe and healthful work environments. This perspective emphasizes the integration of traditional controls to protect workers from injury and occupational illness with protections and supports to advance well-being and health. Within this perspective the first priority is to identify workplace hazards and implement interventions to eliminate or control them. However, this expanded perspective also encourages workplace enhancements that foster worker health and well-being.
Also offered as ESHH 621.
ESHH 529 - Environmental Toxicology \& Risk Assessment (4)

This course covers the toxicological aspects of chemicals in the environment as well as risk assessment. Methods for both humanhealth and ecological risk assessment will be presented including hazard identification, exposure as sessment, dose-response relationships, risk communication, and toxicity testing. While there are no prerequisites, a good foundation in chemistry and familiarity with environmental science are recommended.

## ESHH 530 - Environmental and Occupational Health Chemistry (4)

This course provides an overview of chemical processes that are important in environmental and occupational health. Applications of core chemical concepts are developed through case-studies involving is sues of major importance to public health. Examples include dis infection of drinking water, biologically-derived toxins, exposure to heavy metals, use of agricultural chemicals, chemical additives in household products, indoor air quality, etc. Some college level chemistry background is desirable, but there are no specific prerequis ites.

## ESHH 532 - Ecological Public Health ()

The course provides an introduction to biological processes in environmental systems and the influence of human activities on these processes. Topics include ecology and evolution, population growth, natural res ources, and
environmental sustainability. In addition to fundamental knowledge in biology, students will demonstrate understanding of environmental inter-relationships and contemporary environmental issues.

## ESHH 611 - Concepts of Environmental Health (3)

An intensive course designed to familiarize students with fundamentals of environmental health froma scientific and conceptual perspective. Topics are considered within multi-causal, ecological, adaptive systems, and riskas essment frameworks. Includes consideration of biological, chemical, and physical agents in the environment, which influence public health and wellbeing. Recommended prerequisite: graduate standing.
Also offered as ESHH 511.
ESHH 612 - Global \& Planetary Health Concepts (3)
Provides an introduction to Global and Planetary Health. It will focus on the factors that make public health a priority at regional and global scales. It will also address the underlying processes that determine public health in a range of regional settings.
Also offered as ESHH 512 for master's students and may be taken only oncefor credit.

## ESHH 621 -Principles of Occupational Health (4)

Occupational Health students will learn about the current Total Worker Health ${ }^{\circledR}$ approach to creating safe and healthful work environments. This perspective emphasizes the integration of traditional controls to protect workers from injury and occupational illness with protections and supports to advance well-being and health. Within this perspective the first priority is to identify workplace hazards
and implement interventions to eliminate or control them. However, this expanded perspective also encourages workplace enh ancements that foster worker health and well-being.
Also offered as ESHH 521.

## ESM - Environmental Sci \& Mgmt

ESM 100 - Portland's Environment (4)
Highlights aspects of Portland's environment that make it a great place to learn. Four sections: 1) Great Things Portland's natural and social assets, 2) Challenges and human impacts, 3) Possible solutions - experiments in science and management, and4) Engagement - Portland's big advantage.

## ESM 101 - Environmental Sciences I(4)

Introduction to the study of the environment and sustainability with a focus on natural processes. Topics will include physical processes and concepts related to air, water, and land as well as ecological processes and concepts including ecosystems, communities, biodiversity, population dynamics, agriculture, and conservation ecology. One two-hour laboratory. The laboratory projects will focus on urbanstreams, ecosystems of the Portland metropolitan region, and environmental impacts of land use.

Corequisite: ESM 101L.

## ESM 101L - Lab for Environmental Sciences I(0)

Lab for ESM 101 EnvironmentalScience.
Corequisite: ESM 101.

## ESM 102 - Environmental Sciences II(4)

Introduction to the analytical study of the interaction between humans and the environment. This term will focus on is sues of environmental degradation. Topics will include human population growth, pollution of the air and water, energy res ource use, and social and economic bas is for sustainability. One 2-hour laboratory. The laboratory projects will focus on impact of population growth, pollution, and resource conservation.
Corequisite: ESM 102L.

## ESM 102L - Lab for Environmental Sciences II (0)

Lab for Environmental Sciences II
Corequisite: ESM 102.

## ESM 150 - Orientation to Environmental Sciences and Management (1)

Self-paced online orientation that covers: virtual tour of PSU and ESM facilities, surveys of the two degrees, prerequisite courses, UNST orHonors, Career Center, graduate programs, internships, creating a portfolio, student interviews, and steps to getting started.

## ESM 199 - Special Studies (1-9)

See department for course description. (Credit to be arranged.)

## ESM 220 - Introduction to Environmental Systems (4)

Introduction to the structure and function of terrestrial, aquatic, and atmospheric sy stems, including the human actions that affect them. Includes a lab section that introduces basic quantitative techniques for collecting and analyzing data fromenvironmental systems; 2 lecture periods, one3-hour lab.

Prerequisite: Mth 111 (may be taken concurrently; if you take ALEKS math placement exam and receive a score of 60 or above, email the instructor to request this prerequisite be waived). Corequisite: ESM 220L.
ESM 220L - Introduction to Environmental Systems Lab (0)

Lab for ESM 220 Introduction to Environmental Systems. Corequisite: ESM 220.

## ESM 221 - Applied Environmental Studies: Problem

 Solving (4)Environmental problem solving, sampling, design for quantitative sampling, and meas urement.
Prerequisite: ESM 220 or (ESM 101 and ESM 102); Math 111 (instructor will waive this prerequisite with an ALEKS score of $>59$ ). Corequisite: ESM 221 L .

ESM 221L - Applied Environmental Studies: Problem Solving Lab (0)
Lab for Applied Environmental Studies:ProblemSolving.
Corequisite: ESM 221.

## ESM 222 - Applied Environmental Studies: Policy Consideration (4)

Introduction to environmental laws and the regulations promulgated under them. Includes an examination of the genesis of these laws (e.g., NEPA, Clean Air and Water Acts, RCRA Endangered Species Act) and their history of compliance and violation. Recommended prerequisite: ESM 220 and 221.

## ESM 230 - Fundamentals of Environmental Chemistry I (4)

Basic concepts and principles of chemistry as it applies to environmental problems. This will include, the nature of matter and chemical reactions, water chemistry, water pollution, atmospheric chemistry, soilchemistry, toxicological chemistry and industrial ecology. Examples will be used that illustrate the social and economic importance of environmental chemistry. This is the first course in a sequence of two: ESM 230 and ESM 231 and must be taken in sequence.
Corequisite: ESM 230R.
ESM 230L - Lab for Environmental Chemistry I (0)
Lab for Environmental Chemistry I.

## ESM 230R - Recitation for Environmental Chemistry I.

 (0)Recitation for Environmental Chemistry I.

Corequisite: ESM 230.
ESM 231 - Fundamentals of Environmental Chemistry II (4)

Basic concepts and principles of chemistry as it applies to environmental problems. This will include, the nature of matter and chemical reactions, water chemistry, water pollution, atmospheric chemistry, soil chemistry, toxicological chemistry and industrial ecology. Examples will be used that illustrate the social and economic importance of environmental chemistry. This is the second course in a sequenceof two: ESM 230 and ESM 231 and must be taken in sequence.
Prerequisite: ESM 230. Corequisite: ESM 231L.
ESM 231L - Lab for ESM 231 (0)
Lab for ESM 231.
Corequisite: ESM 231.
ESM 315 - Environmental Sampling and Contaminant Analysis (4)

Provides experience with environmental sampling techniques and the quantitative analysis of contaminants in water, soil and air. Explore the chemical and physical principles underlying the sources, transformation and fate of contaminants in the environment. One one-hour lecture and two three-hour labs per week.

Prerequisite: ESM 230 and ESM 231.

## ESM 320 - Environmental Systems I(4)

Structure and function of environmental physical systems such as mass and heat transport in lakes, rivers, oceans and atmosphere, climate and climate forcing, and global circulation. Co-requisite: ESM 323. Expected preparation: Mth 241 or Mth 251, and fourcredits each in biology, chemistry, and physics or geology.

Corequisite: ESM 323.

## ESM 321 - Environmental Systems II (4)

Introduction to the structure and function of environmental systems with an emphasis on ecological processes and human impacts. Co-requis ite: ESM 324.
Prerequisite: ESM 320, ESM 323. Corequisite: ESM 324.

## ESM 322 - Environmental Risk Assessment (4)

Overview of risk assessmentapplied to en vironmental problems, including the impact assessment process, application of cost-benefit analysis, hazard identification, risk characterization, risk as sessment, and risk management. Co-requisite: ESM 325.

Prerequisite: ESM 320, ESM 321, ESM 323, ESM 324. Corequisite: ESM 325.

## ESM 323 - Environmental Systems Laboratory I (2)

Laboratory work to accompany Environmental Systems I (ESM 320). One 4-hour laboratory period. Requires concurrent enrollment in ESM 320.

Corequisite: ESM 320.
ESM 324 - Environmental Systems Laboratory II (2)
Laboratory work to accompany Environmental Systems II (ESM 321). One 4-hour laboratory period. Requires concurrent enrollment in ESM 321.

Corequisite: ESM 321.

## ESM 325 - Environmental Risk Assessment Lab (2)

Provides an overview of the main techniques used for environmentalrisk as sessment. Emphasis is on laboratory acute and chronic toxicity tests and field biological stream as sessment. Expected preparation: ESM 321, ESM 322, ESM 324. Co-requisite: ESM 322.
Corequisite: ESM 322.

## ESM 330 - Environmental and Ecological Literacy (4)

Introduces a broad range of thought about ecology and the environment, including supporters and critics such as Aldo Leopold, David Orr, Bjorn Lomborg, E.O. Wils on and Thomas Berry. Addresses the idea of ecological literacy as a key aspect in education and understanding the environment. Recommended prerequisites: ESM 220, 221, and 222.

ESM 333 - Methods of Data Collection, Analysis, Representation, and Modeling for Environmental Managers (4)
Overview and review of main techniques for collecting, modeling and analy zing both scientific and social data; key activities for environmental managers. Co-requisite: ESM 334.

Prerequisite: ESM 220, ESM 221, and ESM 222. Corequisite: ESM 334.

ESM 334 - Methods of Data Collection, Analysis, Representation, and Modeling for Environmental Managers Lab (2)
Lab accompanying the lecture class: ESM 333, provides practice and review of main techniques for collecting, modeling and analyzing both scientific and social data; key activities for environmental managers. Co-requisite: ESM 333.

Corequisite: ESM 333.

## ESM 335 - Introduction to Environmental Management (4)

Course will focus on environmental project management. Survey of agencies and entities that currently do management and under what authority. Introduction to general theory of environmental management and strategies that are being used. Case studies of local management project and is sues.
Prerequisite: ESM 222.

## ESM 340 - Research Methods in Environmental Science (4)

Integrates quantitative skills into environmental research. Introduces research methods commonly used in environmental studies with emphasis on environmental study designs, data analy ses, and data interpretations.

## ESM 342 - Field Methods (2)

Presents crucial safety, field and research skills for environmental research. Presents differents kill sets for different types of field work for example in lakes, wetlands, forests or marine environments. Students may count two sections of this class toward an Environmental Science or Environmental Studies major. (May be taken twice).

## ESM 343 - Environmental Problem Solving: Restoring Ecos ystemDamage from Human Impacts (4)

Inquiry based coursethat addresses many problems that can be addressed through environmental restoration. Analysis of potential solutions based on ecolo gical principles and management efficacy. Projects will address site evaluation, tests for effectiveness, and design considerations.

Prerequisite: Sci 341 U or Sci 342U. Corequisite: ESM 343L.

ESM 343L - Lab for ESM 343 (0)
Lab for ESM 343.
Corequisite: ESM 343.

## ESM 355U- Understanding Environmental

 Sustainability I (4)Emphasizing sustainability, study of the scientific and ecological principles that govern human interactions with the physical and biological systems of the earth. Topics will include ecosystemproperties, earth systemproperties, human population dynamics, and the roles of technological and ethical decisions. Not intended for science majors.

## ESM 356U - Understanding Environmental Sustainability II (4)

Introduction to the concepts and principles necessary to understand the complexrelationship between humans and environmental sustainability. Topics will include natural resources issues with a focus on nature's services, the global cris is in water, biodiversity, and food; soil function, the fate of environmentaltoxins and public health, climate change, alternative energy, as well as ethics, governance, regulatory compliance, and community understanding. Not intended forscience majors. Expected preparation: UnSt 224 or ESM 355.

## ESM 357U - Business Solutions for Environmental Problems (4)

Environmental science perspectives and business pers pectives on environmental is sues, focusing on smaller scale problems amenable to entrepreneurial solutions. Contextualization and analysis of issues using approaches and tools fromboth disciplines in search of local, sustainable, cost and scale-effective approaches. .

## ESM 399 - Special Studies (1-9)

See department for course description. (Credit to be arranged.)

## ESM 401 - Research (0-8)

Consentof instructor and programdirector. See department for course description. (Credit to be arranged.)

## ESM 402 - Independent Study (1-12)

(Credit to be arranged.)

ESM 403 - Thesis (1-12)
(Credit to be arranged.)

## ESM 404 - Cooperative Ed/Internship (0-12)

See department for course description. (Credit to be arranged.)

## ESM 405 - Reading and Conference (0-9)

See department for course description. (Credit to be arranged.)

## ESM 406 - Special Projects (1-12)

(Credits to be arranged.)

## ESM 407 - Environmental Sciences Seminar (0-6)

Weekly seminar series involving student-led discussion of topical environmental is sues. May be repeated for up to 3 credits.

## ESM 410 -SelectedTopics (1-12)

Consentof instructor. See department for course description. (Credit to be arranged.)

## ESM 415-Road Ecology (4)

Environmental impacts of roads and mitigation. Issues as sociated with road systemconstruction, maintenance, and operation. Projects on the ecological effects of roads will bring real-world perspectives to the class, helping students understand current problems and research needs.
Also offered for graduate-level credit as ESM 515 and may be taken only once for credit. Prerequisite: any undergraduate environmental science course.

## ESM 416 - Ecos ystem Restoration (4)

Ecological theories and principles that guide restoration practices in a variety of ecosystems, including rivers, wetlands, forests, and prairies. Causes of ecosystem degradation, motivations for restoration, and factors that influence success in restoration. Interactions between science, philosophy, engineering, environmental management, policy, and politics in the dynamic world of ecosystemrestoration.
Also offered for graduate-level credit as ESM 516 and may be taken only once forcredit. . Prerequisite: ESM 335 or Geog 345U or Bi 357 or ESM 321.

## ESM 417 - Applied Watershed Restoration (4)

Fundamentals of applied watershed/streamrestoration: hydrologic, hydraulic, geomorphic, andecological principles and tools applicable to the assessment of waters hed and reach-scale processes and evaluation of streamchannel condition. Emphasis on the inter-related nature of physical processes and aquatic and riparian ecology at both the watershed and reach-scale.
Also offered for graduate-level credit as ESM 517 and may be taken only once for credit. Prerequis ite: Upper-division standing.

## ESM 418 -Landscape Ecology (4)

Examines the structure, function, and change of natural and human-modified communities at the scale between
individual communities and regional biomes. Focuses on spatial patterns and processes as they relate to the patch mosaic of inter- acting ecological communities. Expected preparation: Geog 313 or Bi 357 . Upper-divis ion standing required. This is the same course as Geog 418 and may be taken only once for credit.
Also offered for graduate-level credit as ESM 518 and may be taken only once for credit. Cross-Listed as: Geog 418.

## ESM 420 - Ecological Toxicology (4)

Effects of environmental contaminants at the individual, population, and ecosystemlevel. Topics will include toxicity test methods, en vironmental fate of contaminants, and the physiological and ecological effects of selected heavy metals, chlorinated organics, and pesticides.
Also offered for graduate-level credit as ESM 520 and may be taken only once for credit.

## ESM 424 - Wetland Ecology (4)

Structure and function of wetland ecosystems, with an emphas is on the diversity of regional wetland systems. Topics also include wetland soils, plants, and hy drologic setting and requirements for wetland delineation.
Also offered for graduate-level credit as ESM 524 and may be taken only oncefor credit.

## ESM 425 - WatershedHydrology (4)

Study of the movement and storage of water in watersheds, emphas izing physical processes. Includes systems analysis of waters heds, precipitation, s nowmelt, infiltration, evapotranspiration, ground water flow, streamflow generation, open channel flow, hydrograph analysis and an introduction to watershed hydrologic modeling. Expected preparation: Mth 252, Ph 201.
Also offered for graduate-level credit as ESM 525 and may be taken only once for credit. .

## ESM 426 - Ecology of Streams and Rivers (4)

Evaluation of streams and rivers froman ecosystem perspective, including streamdevelopment, biological communities, ecological processes, and methods of as sessment as applied to evaluation of common environmentalproblems.
Also offered for graduate-level credit as ESM 526 and may be taken only once for credit.

## ESM 427 - WatershedBiogeochemistry (4)

Study of the chemis try of watershed-based ecosystems, emphas izing physical and biological processes. Mechanisms of atmos pheric input; rock weathering and soil development; physical and biological controls on the storage and flux of minerals, carbon, and nutrients in terrestrial ecosystems; and impacts of managementon
biogeochemical processes in watershed-based ecosystems. Expected preparation: Bi 253, Ch 221.

Also offered for graduate-level credit as ESM 527 and may be taken only once forcredit. .

## ESM 428 - Urban Ecology (4)

Study of ecological processes in urban environments. Emphas is on responses of flora and faunato changes in climate, hydrology, geomorphology, geochemistry, soils and available habitat in urban areas. Includes is sues of species conservation, ecosystemmanagement and sustainability in urban systems. Expected preparation: an undergraduate biology course or permission of ins tructor.
Also offered for graduate-level credit as ESM 528 and may be taken only once forcredit. .

## ESM 429 - Environmental Impact Assessment (4)

Environmental as sessments and impact as sessment techniques; regulatory and technical requirements of impact as sessment. The National Environmental Policy Act, its implementation, implications and uses.

Also offered for graduate-level credit as ESM 529 and may be taken only onceforcredit.

## ESM 433 - Natural Resource Economics (4)

An examination of the economic concepts and theories for analyzing natural res ource use and related environmental pollution, including the economics of sustainability. Discussion of renewable and nonrenewable natural resource is sues in the Pacific Northwest and policy alternatives. This is the same course as Ec 433 and may be taken only once for credit. Expected preparation: Ec 201.
Also offered for graduate-level credit as ESM 533 and may be taken only onceforcredit. Cross-Listed as: Ec 433.

## ESM 434 - Business Environmental Management Economics (4)

Examines the economic costs and benefits that affect the decisions of business firms to develop integrated environmental management systems. Analysis of policy options to foster business environmental management for public goods. Case studies of selected firms. This is the same course as Ec 434 and may be taken only once for credit. Expected preparation: Ec 201.

Also offered for graduate-level credit as ESM 534 and may be taken only once forcredit. Cross-Listed as: Ec 434.

## ESM 435 - Natural Res ource Policy and Management (4)

The impact of natural resource policy and management on regional and federal levels. Case studies will focus on the complex settings, difficult socioeconomic contexts and charged politicalenvironments.

Also offered for graduate-level credit as ESM 535 and may be taken only once for credit. . Prerequisite: ESM 335.

## ESM 436 - Environmental Institutions and Management (4)

Fundamental concepts of environmental management with case studies illus trating current management is sues regarding human environment interactions. Participants will learn management theory and concepts and apply this knowledge through field work conducting institutional analys is and presenting a group management plan for a localsite.

Als o offered for graduate-level credit as ESM 536 and may be taken only once for credit. . Prerequisite: ESM 335.

## ESM 440 - The Ecology \& Management of Wildfire (4)

A field-based class offered jointly by the Departments of EnvironmentalScience Management and Geography. This class focuses on the complex challenges of managing wildfire in integrated social and ecological systems (SESs) and uses the western US as case study to focus on the biophysical and social science behind those challenges. The course adds field studies in NE Oregon to understand how integrated SESs manage wildfire and wildfire risks in practice.

Also offered for graduate-level credit as ESM 540 and may be taken only once for credit. Prerequisite: Upper-division standing. Cross-Listed as: This is the same course as Geog 440 and may be taken only once for credit.

## ESM 443 - Global Environmental Economics (4)

An examination of the economic forces and theories to understand the causes of global environmental problems, and to evaluate policy options to remedy serious problems. Analyses of the economic effects of global environmental agreements and the environmental effects of trade and global commerce in developed and developing countries. This course is the s ame as Ec 443 and may be taken only once for credit.

Also offered for graduate-level credit as ESM 543 and may be taken only once for credit. Cross-Listed as: Ec 443.

## ESM 444 - Forest Ecology (4)

Study of fores ted ecosystems, their biotic and abiotic drivers, and the theories and tools that we use to understand forest ecosystems and project how they will change. Forest ecology considers forest succession, carbon and nitrogen dynamics of forests, forest soils, climate and weather, water and energy balances, and disturbances.

Also offered for graduate-level credit as ESM 544 and may be taken only once for credit. . Prerequisite: ESM 320 and ESM 321.

## ESM 445 - Old-growth Forest Ecology (4)

Exploration of the ecological characteristics of west-side old-growth forests, including theiroutstanding biodiversity. Landscape level as pects of forestecosystems, including the role of fire; plus the use of basic forestry meas urements to contrastold-growth, second-growth, and plantation stands of trees. Emphasizing field study, this eight-day course is based at an off-campus location for easy access to forest ecosystems. Field site costs in addition to tuition. Expected preparation: upper-division or graduate standing required and an undergraduate sequence in biology.
Also offered for graduate-level credit as ESM 545 and may be taken only once forcredit. .

## ESM 450 - Case Studies in Environmental Problem Solving (0-6)

Evaluation of selected cases of environmental problems, including field studies and project work with government and private agencies. Expected preparation:ESM 320, ESM 321, ESM 322.

## ESM 451 - Project Management for Scientists (4)

Managing a scienceorenvironmental project is unique, requiring knowledge of the science discipline, project management, public participation and regulatory requirements. Topics include: defining project and tasks; understanding client or internal needs; establishing project org anization, staffing, costs; public participation; satisfying regulatory requirements; adaptive management. Group work using case studies included.
Also offered for graduate-level credit as ESM 551 and may be taken only once for credit. .Prerequisite: upper-division standing.

## ESM 460 - Air Quality (4)

An overview of urban air quality is sues facing cities in the US and globally. Examine effects of air pollution on public health and environment, as well as technologies and regulatory practices. Review pollution measurement and modeling techniques. This is the same course as CE488 and may be taken only once for credit. Expected preparation: ESM 320.

Also offered for graduate-level credit as ESM 560 and may be taken only once for credit. . Cross-Listed as: CE 488.
ESM 462 - Climate Change Impacts, Adaptations and Responses: Geosphere and Anthrosphere (4)

Examination of the bas is for human-influenced global climate change, the interactions and feedbacks, the impact on urban and natural systems, and the management adaptation and solutions to these impacts.

Also offered for graduate-level credit as ESM 562 and may be taken only once for credit. . Prerequisite: Senior or graduate standing in ESM.

## ESM 463 - Water Quality Policy \& Management (4)

Review and assessment the efficacy of water quality laws, regulations, and policies. Focus on the Water Quality Standards for the State of Oregon for temperature, bacteria, chemical toxins and nutrients. Role of science in decisions protecting and restoring rivers fromwater pollution.
Also offered for graduate-level credit as ESM 563 and may be taken only once for credit. . Prerequisite: ESM 335.

## ESM 464 - Climate Adaptation: Managing Environmental Risks andVulnerabilities (4)

Contribution to climate risk management will require an understanding of the fundamentals of adaptation planning, climate impacts, risk and vulnerability, and implementation. An adaptation-centered view focuses on the power of local actors to develop strategies that protect and facilitate human and environmental values under threat from global change.
Also offered for graduate-level credit as ESM 564 and may be taken only once for credit. . Prerequisite: ESM 335 or equivalent.

## ESM 465 - Investigating Ecological and Social Issues in Urban Parks and Natural Areas (4)

Examines ecological and social aspects of urban forests. Emphasizes response of native plants to physical and introduced species impacts fromurbanization. Students will collect ecological and visitor impact data in local parks, study is sues pertaining to sustainability and management based on an understanding of short termand longer-term disturbances.

Also offered for graduate-level credit as ESM 565 and may be taken only once for credit. . Prerequisite: Environmental studies or environmental science major or Bi 357.

## ESM 471 - Atmospheric Physics (4)

Cycles of trace gases in the Earth's atmosphere and their role in the environment. Emission, dis persal, and removal of natural and man-madetrace constituents in the atmosphere that determine the Earth's climate and stratospheric ozone layer. This is the same course as Ph 471 and may only be taken only once for credit. Recommended: introductory course in differential equations.
Also offered for graduate-level credit as ESM 571 and may be taken only once for credit. Prerequis ite: one year each of calculus and calculus-based physics. Cross-Listed as: Ph 471.

## ESM 473 - Phytoplankton Ecology (4)

Examination of photosynthesis, nutrient uptake, regulation and cell growth processes in the context of algal growth in natural waters. Expected preparation: Bi 211; ESM 321 or Bi 357.

Also offered for graduate-level credit as ESM 573 and may be taken only once for credit. .

## ESM 474 - Fish Ecology and Conservation (4)

This course provides a multidisciplinary focus on major ecological issues related to fish conservation, with a strong emphasis on grounding ecological concepts in real-life case studies. The course incorporates lectures and paper discussions related to fish conservation is sues in the Pacific Northwest and beyond.

Also offered for graduate-level credit as ESM 574 and may be taken only once forcredit. Prerequisite: ESM 221.

## ESM 475 - Limnology and Aquatic Ecology (4)

Encompasses biological, physical, geological, and chemical aspects of freshwater environments. Overview of lake ecosystems, emphasizing fundamental interactions, processes, and ecology, as well as an appreciation of the impact of human activities on these waterbodies. A field trip is required. Expected preparation: Ch 223.

Also offered for graduate-level credit as ESM 575 and may be taken only once forcredit. .Prerequisite: ESM 321 or Bi 357. Corequisite: ESM 477.

ESM 477 - Limnology Laboratory (2)
Techniques in field and laboratory analysis of freshwater systems. Recommended pre- or corequisite: ESM 475/575.
Also offered for graduate-level credit as ESM 577 and may be taken only once for credit. . Corequisite: ESM 475.

## ESM 478 - Aquatic Vascular Plants (4)

Classification, biology, ecology, and management of aquatic vascular plants. Course will focus on freshwater systems and include a laboratory featuring field identification and laboratory experimentation. Expected preparation: Bi 357.
Also offered for graduate-level credit as ESM 578 and may be taken only once for credit. .

## ESM 479 - Fate and Transport of Toxics in the Environment (4)

Chemical, physical, and biological principles that govern the behavior of toxic materials such as heavy metals and synthetic organic compounds in the environment. Course emphasizes practical ways to represent chemical processes in models of pollutant behavior. Topics include: adsorption of pollutants on soils and sediments; transport across sediment-water and air-water interfaces; bioamplification of pollutants; multiphase fugacity models of org anics; case
studies of contaminated surface water, sediment and groundwater. This course is the same as CE479 and may be taken only once for credit. Expected preparation: senior or graduate standing.
Also offered for graduate-level credit as ESM 579 and may be taken only once for credit. Cross-Listed as: CE479.

## ESM 480 - Coastal Marine Ecology (4)

Introduces the relationships between marine species and their environment, intra- and inter-specific interactions, and factors structuring marine communities. Community structure and dis tribution presented in the context of both oceanography and coastal zone ecology. Marine conservation is sues, including fisheries, addressed. A field trip required. Expected preparation: ESM 321.

Also offered for graduate-level credit as ESM 580 and may be taken only once for credit. .

## ESM 483 - Marine Conservation and Management (4)

This course will be divided into three sections. We will begin by discussing the state of the oceans, and ecological differences bet ween marine and terrestrial/aquatic systems. The second part of the course will discuss the major threats to ocean systems. The third part of the course will focus on solutions in terms of protected areas, management and policy strategies, and various aspects of the human dimension. Expected preparation: ESM 335.
Also offered for graduate-level credit as ESM 583 and may be taken only once for credit. .

## ESM 485 - Ecology and Management of Bio-Invasions

 (4)Invasive, or nonindigenous, species present us with global ecological and economic problems and have been ranked as second only to habitat destruction as a threat to our natural areas and native species. These invasive species are a concern because they restructure ecosystems, affect the evolutionary trajectory of native species, lead to the extinction of species, and impact local industries. Expected preparation: ESM 321.
Also offered for graduate-level credit as ESM 585 and may be taken only once for credit. .

## ESM 487 - Environmental Justice (4)

Explores the foundations of environmental justice theory and how they apply to his torical, current and emerging global is sues. This course explores philosophies of justice and fairness as they relate to environmental 'goods' and 'bads.' We will explore a variety of case studies, touching on interrelated topics including food justice, climate and energy justice, water justice and infrastructure supply and demand, etc. This course blends sociological perspectives with natural resource management and policy implications. Expected preparation ESM 335 or Geog 345U.

Also offered for graduate-level credit as ESM 587 and may be taken only onceforcredit. Prerequisite: Upper-division standing.

## ESM 493 - Advanced Environmental ScienceLab and Field Methods (2)

Trains seniors and graduate students in skills that can be used in field and laboratory research. The specific application and topics will rotate fromterm to term allowing students to learn skills necessary to their own research but also to learn methods employed by other research groups in ESM.

Also offered for graduate-level credit as ESM 593 and may be taken only once for credit. Prerequis ite: Senior or graduate standing.

## ESM 499 - Special Studies (1-8)

See department for course description. Consent of instructor and programdirector. (Credit to be arranged.)

## ESM 501 - Research (1-9)

See department for course description. Consent of instructor and programdirector. (Credit to be arranged.)

## ESM 502 - Independent Study (1-9)

(Credit to be arranged.)

## ESM 503 - Thesis (1-12)

All as pects of research and thesis writing for master's students. (Credit to be arranged.)

## ESM 504 - Cooperative Ed/Internships (1-9)

See department for course description. (Credit to be arranged.)

## ESM 505 - Reading and Conference (1-9)

See department for course description. (Credit to be arranged.)

## ESM 506-Special Projects (1-9)

See department for course description. (Credit to be arranged.)

## ESM 507 - Seminar (1-6)

Weekly seminar series on topical environmental is sues. May be repeated for up to 3 credits for M.S. or M.E.M students.

## ESM 509-Practicum (1-9)

See department for course description. (Credit to be arranged.)

## ESM 510 -Selected Topics (1-12)

See department for course description. Consent of instructor. (Credit to be arranged.)

## ESM 515 - Road Ecology (4)

Environmental impacts of roads and mitigation. Is sues as sociated with road systemconstruction, maintenance, and operation. Projects on the ecological effects of roads will bring real-world pers pectives to theclass, helping students understand current problems and research needs.

Also offered for undergraduate-level credit as ESM 415 and may be taken only once for credit.
ESM 516 - Ecosystem Restoration (4)
Ecological theories and principles that guide restoration practices in a variety of ecosystems, including rivers, wetlands, forests, and prairies. Causes of ecosystem degradation, motivations for restoration, and factors that influence success in restoration. Interactions between science, philosophy, engineering, environmental management, policy, and politics in the dynamic world of ecosystemrestoration.

Also offered for undergraduate-level credit as ESM 416 and may be taken only once for credit. .

## ESM 517 - Applied WatershedRestoration (4)

Fundamentals of applied watershed/streamrestoration: hydrologic, hydraulic, geomorphic, and ecological principles and tools applicable to the assessmentof watershed and reach-scale processes and evaluation of streamchannel condition. Emphasis on the inter-related nature of physical processes and aquatic and riparian ecology at both the watershed and reach-scale.
Also offered for undergraduate-level credit as ESM 417 and may be taken only once for credit.
ESM 518 - Landscape Ecology (4)
Examines the structure, function, and change of natural and human-modified communities at the scale between individual communities and regional biomes. Focuses on spatial patterns and processes as they relate to the patch
mosaic of inter-acting ecological communities. Expected preparation: Geog 313 or Bi 357 . Upper-division standing required. This is the same course as Geog 518 and may be taken only once for credit.
Also offered for undergraduate-level credit as ESM 418 and may be taken only once for credit. Cross-Listed as: Geog 518.

## ESM 520 - Ecological Toxicology (4)

Effects of environmental contaminants at the individual, population, and ecosystemlevel. Topics will include toxicity test methods, environmental fate of contaminants, and the physiological and ecological effects of selected heavy metals, chlorinated org anics, and pesticides.
Also offered for undergraduate-level credit as ESM 420 and may be taken only once for credit.

## ESM 524 - Wetland Ecology (4)

Structure and function of wetland ecosystems, with an emphasis on the diversity of regional wetland systems. Topics also include wetland soils, plants, and hydrologic setting and requirements for wetland delineation.
Also offered for undergraduate-level credit as ESM 424 and may be taken only once for credit.

## ESM 525 - WatershedHydrology (4)

Study of the movement and storage of water in watersheds, emphasizing physical processes. Includes systems analysis of watersheds, precipitation, s nowmelt, infiltration, evapotranspiration, ground water flow, streamflow generation, open channelflow, hydrograph analysis and an introduction to watershed hydrologic modeling. This is the same course as CE565 and may be taken only once for credit.

Also offered for undergraduate-levelcredit as ESM 425 and may be taken only once for credit. . Cross -Listed as: CE 565.

## ESM 526 - Ecology of Streams and Rivers (4)

Evaluation of streams and rivers froman ecosystem perspective, including streamdevelopment, biological communities, ecological processes, and methods of as sessment as applied to evaluation of common environmental problems.
Also offered for undergraduate-level credit as ESM 426 and may be taken only once for credit.

## ESM 527 - WatershedBiogeochemistry (4)

Study of the chemistry of watershed-based ecosystems, emphasizing physical and biological processes. Mechanis ms of atmospheric input; rock weathering and soil development; physical and biological controls on the storage and flux of minerals, carbon, and nutrients in
terrestrial ecosystems; and impacts of management on biogeochemical processes in waters hed-based ecosystems.
Also offered for undergraduate-level credit as ESM 427 and may be taken only once for credit. .

## ESM 528 - Urban Ecology (4)

Study of ecological processes in urban environments. Emphasis on responses of flora and fauna to changes in climate, hydrology, geomorphology, geochemistry, soils and available habitat in urban areas. Includes issues of species conservation, ecosystemmanagement and sustainability in urban systems.
Also offered for undergraduate-level credit as ESM 428 and may be taken only once for credit. .

## ESM 529 - Environmental Impact Assessment (4)

Environmental assessments and impact as sessment techniques; regulatory and technical requirements of impact as sessment. TheNational Environmental Policy Act, its implementation, implications anduses.
Also offered for undergraduate-level credit as ESM 429 and may be taken only once forcredit.

## ESM 533 - Natural Resource Economics (4)

An examination of the economic concepts and theories for analyzing natural resource use and related environmental pollution, including the economics of sustainability. Discussion of renewable and nonrenewable natural resource issues in the Pacific Northwest and policy alternatives. This is the same course as Ec 533 and may be taken only once for credit.
Also offered for undergraduate-level credit as ESM 433 and may be taken only once forcredit. Cross-Lis ted as: Ec 533.

## ESM 534 - Business Environmental Management Economics (4)

Examines the economic costs and benefits that affect the decisions of business firms to develop integrated environmental management systems. Analysis of policy options to foster business environmental management for public goods. Case studies of selected firms. This is the same course as Ec 534 and may be taken only once for credit. Expected preparation: Ec 201.

Also offered for undergraduate-level credit as ESM 434 and may be taken only once for credit. Cross-Listed as: Ec 534.

## ESM 535 - Natural Resource Policy and Management (4)

The impact of natural res ource policy and management on regional and federal levels. Case studies will focus on the complex settings, difficult socioeconomic contexts and charged politicalenvironments.

Also offered for undergraduate-levelcredit as ESM 435 and may be taken only once for credit. . Prerequisite: ESM 335.

## ESM 536 - Environmental Institutions and Management (4)

Fundamental concepts of environmental management with case studies illustrating current management is sues reg arding human environment interactions. Participants will learn management theory and concepts and apply this knowledge through field work conducting institutional analys is and presenting a group management plan for a localsite.
Also offered for undergraduate-level credit as ESM 436 and may be taken only once for credit.

ESM 540 - The Ecology and Management of Wildfire (4)

A field-based class offered jointly by the Departments of Environmental Science Management and Geography. This class focuses on the complexchallenges of managing wildfire in integrated social and ecological systems (SESs) and uses the western US as case study to focus on the biophysical and social science behind those challenges. The course adds field studies in NE Oregon to understand how integrated SESs manage wildfire and wildfire risks in practice.
Also offered for undergraduate-level credit as ESM 440 and may be taken only once for credit. Cross-Listed as: This is the same course as Geog 540 and may be taken only once for credit.

## ESM 543 - Global Environmental Economics (4)

An examination of the economic forces and theories to understand the causes of global environmental problems, and to evaluate policy options to remedy serious problems. Analyses of the economic effects of global environmental agreements and the environmental effects of trade and global commerce in developed and developing countries. This course is the same as Ec 543 and may be taken only once for credit.
Also offered for undergraduate-level credit as ESM 443 and may be taken only once for credit. Cross-Listed as: Ec 543.

## ESM 544 - Forest Ecology (4)

Study of forested ecosystems, their biotic and abiotic drivers, and the theories and tools that we use to understand forest ecosystems and project how they will change. Forest ecology considers forest succession, carbon and nitrogen dynamics of forests, forest soils, climate and weather, water and energy balances, and dis turbances.
Also offered for undergraduate-levelcredit as ESM 444 and may be taken only once for credit. .

## ESM 545 - Old-growth Forest Ecology (4)

Exploration of the ecological characteristics of west-side old-growth forests, including their outstanding biodiversity. Landscape level aspects of forestecosystems, including the role of fire; plus the use of basic forestry meas urements to contrastold-growth, second-growth, and plantation stands of trees. Emphasizing field study, this eight-day course is based at an off-campus location for easy access to forest ecosystems. Field site costs in addition to tuition.
Also offered for undergraduate-level credit as ESM 445 and may be taken only once forcredit. .

## ESM 551 - Project Management for Scientists (4)

Managing a science or en vironmental project is unique, requiring knowledge of the science discipline, project management, public participation and regulatory requirements. Topics include: defining project and tasks; understanding client or internal needs; establishing project organization, staffing, costs; public participation; satisfying regulatory requirements; adaptive management. Group work using case studies included.
Also offered for undergraduate-level credit as ESM 451 and may be taken only once forcredit. . Prerequisite: upper-division standing.

## ESM 552 - Environmental Regulation and Non-

 regulatory Approaches (3)Understanding environmental regulations and the interaction between governmental agencies and business is critical. Course provides basics of major environmental regulations, how local, state and the federal governments are responding to regulatory is sues, and interaction with businesses through innovation and performance based approaches. Case studies and group work included.

## ESM 554 - Graduate Research Toolbox (4)

Students will developexperimental design, research, grant writing, oral presentation, thesis preparation, peer review, library, and time management skills relevant to their graduate degree.

## ESM 555 -Science Communication (1)

Students will outline the objectives involved in presenting scientific information to different audiences, including the role of the speaker, visual presentation of data, written and mixed media. This is the same course as ESR 655 and may be taken only once for credit.
Cross-Listed as: ESR 655.

## ESM 556 - Advanced Science Communication Skills (1)

Students will explore more advanced topics on presentation and proposal preparation. All students will prepare a mocked up posterbased on cognitive and graphic design principles. They will create an extended outline for a research proposal. Peers in class will critique posters and proposals. This is the same course as ESR 656 and may be taken only once for credit.
Prerequisite: G610 Writing Skills or ESM 555. CrossListed as: ESR 656.

ESM 557 -Science, Media and the Public: Working with the Media to Create Effective Scientific Messages (1)

Scientists need to explain their studies to the public through mass media. Topics include; audience, different media, the reporters' process, editor's view of science stories, and how inaccuracies get perpetuated. Students will evaluate a wide variety of mass media materials, interview practice, and guests' description of various media. This is the same course as ESR 657 and may be taken only once for credit.
Cross-Listed as: ESR 657.

## ESM 560 - Air Quality (4)

An overview of urban air quality is sues facing cities in the US and globally. Examine effects of air pollution on public health and environment, as well as technologies and regulatory practices. Review pollution measurement and modeling techniques. This is the same course as CE588 and may be taken only once for credit.
Also offered for undergraduate-level credit as ESM 460 and may be taken only once for credit. . Cross-Listed as: CE 588.

ESM 562 - Climate Change Impacts, Adaptations and Res ponses: Geosphere and Anthrosphere (4)
Examination of the basis for human-influenced global climate change, the interactions and feedbacks, the impact on urban and natural systems, and the management adaptation and solutions to these impacts.
Also offered for undergraduate-level credit as ESM 462 and may be taken only once for credit.

## ESM 563 - Water Quality Policy \& Management (4)

Review and assessment the efficacy of water quality laws, regulations, and policies. Focus on the W ater Quality Standards for the State of Oregon for temperature, bacteria, chemical toxins and nutrients. Role of science in decisions protecting and restoring rivers fromwater pollution.
Also offered for undergraduate-level credit as ESM 463 and may be taken only once for credit. .

## ESM 564-Climate Adaptation: Managing

 Environmental Risks andVulnerabilities (4)Contribution to climate risk management will require an understanding of the fundamentals of adaptation planning, climate impacts, risk and vulnerability, and implementation. An adaptation-centered view focuses on the power of local actors to develop strategies that protect and facilitate human and environmental values under threat from global change.
Also offered for undergraduate-level credit as ESM 464 and may be taken only once forcredit.

ESM 565 - Investigating Ecological and Social Issues in Urban Parks and Natural Areas (4)
Examines ecological and social as pects of urban forests. Emphasizes response of native plants to physical and introduced species impacts fromurbanization. Students will collect ecological and visitor impact data in local parks, study is sues pertaining to sustainability and management based on an understanding of short termand longer-termdisturbances.

Also offered for undergraduate-level credit as ESM 465 and may be taken only once forcredit. .

## ESM 566 - Environmental Data Analysis (4)

Application of probabilistic and statistical models to the description of environmental data with a focus on hydrology and water quality. Graphical and quantitative techniques of exploratory data analysis, selection and fitting of appropriate probability dis tributions, simple and multiple and multivariate regression and their applications to analys is and modeling, and detection of changes and trends in environmental time series. This is the same course as CE566 and may be taken only once for credit.

Prerequis ite: graduatestanding and Stat 243 and 244 or Stat 460. Cross-Listed as: CE 566.

## ESM 567 - Multivariate Analysis of Environmental Data (4)

Biologicaland environmental data are usually complex, cons isting of many observations and variables. This course provides an overvie w of the main techniques of multivariate data analysis that are relevant and useful in ecology and environmental science. Emphasis is on ordination and cluster analysis.
Prerequisite: one college-level statistics course.
ESM 570 - Methods for Informal Environmental Education (4)
Overview of the purpose and scope of citizen science. Provides an educational framework for the range of possible citizen programs, methodology for planning and training participants, and methods of as sessment of
outcomes. Students will be expected to participate in practical experience working with one or more programs.

## ESM 571 - Atmos pheric Physics (4)

Cycles of trace gases in the Earth's atmosphere and their role in the environment. Emission, dis persal, and removal of natural and man-made trace constituents in the atmosphere that determine the Earth's climate and stratospheric ozone layer. This is thes ame course as Ph 571 and may only be taken only once for credit.

Also offered for undergraduate-level credit as ESM 471 and may be taken only once for credit. Cross-Listed as: Ph 571.

## ESM 573 - Phytoplankton Ecology (4)

Examination of photosynthesis, nutrient uptake, regulation and cell growth processes in the context of algal growth in natural waters.

Also offered for undergraduate-level credit as ESM 473 and may be taken only once for credit.

## ESM 574 - Fish Ecology and Conservation (4)

This course provides a multidis ciplinary focus on major ecological is sues related to fish conservation, with a strong emphasis on grounding ecological concepts in real-life case studies. The course incorporates lectures and paper discussions related to fish conservation is sues in the Pacific Northwest and beyond.
Also offered for undergraduate-level credit as ESM 474 and may be taken only once for credit.

## ESM 575 - Limnology and Aquatic Ecology (4)

Encompasses biological, physical, geological, and chemical aspects of freshwater environments. Overview of lake ecosystems, emphasizing fundamental interactions, processes, and ecology, as well as an appreciation of the impact of human activities on these waterbodies. A field trip is required.

Also offered for undergraduate-levelcredit as ESM 475 and may be taken only once for credit. . Corequisite: ESM 577.

## ESM 577 - Limnology Laboratory (2)

Techniques in field and laboratory analysis of freshwater systems. Recommended pre- or corequisite: ESM 475/575.
Also offered for undergraduate-level credit as ESM 477 and may be taken only once for credit. . Corequisite:ESM 575.

ESM 578 - Aquatic Vascular Plants (4)
Classification, biology, ecology, and management of aquatic vascular plants. Course will focus on freshwater
systems and include a laboratory featuring field identification and laboratory experimentation.

Also offered for undergraduate-level credit as ESM 478 and may be taken only once for credit. .

## ESM 579 - Fate and Transport of Toxics in the Environment (4)

Chemical, physical, and biological principles that govern the behavior of toxic materials such as heavy metals and synthetic organic compounds in the environment. Course emphasizes practical ways to represent chemical processes in models of pollutant behavior. Topics include: adsorption of pollutants on soils and sediments; transport across sediment-water and air-water interfaces; bioamplification of pollutants; multiph ase fugacity models of org anics; case studies of contaminated surface water, sediment and groundwater. This course is the same as CE579 and may be taken only once for credit. Expected preparation: senior or graduate standing.
Also offered for undergraduate-level credit as ESM 479 and may be taken only once for credit. Cross-Lis ted as: CE 579.

## ESM 580 - Coastal Marine Ecology (4)

Introduces the relationships between marine species and their environment, intra- and inter-specific interactions, and factors structuring marine communities. Community structure and dis tribution presented in the context of both oceanography and coastal zone ecology. Marine conservation issues, including fisheries, addressed. A field trip required.
Also offered for undergraduate-level credit as ESM 480 and may be taken only once for credit.

## ESM 583 - Marine Conservation and Management (4)

This course will be divided into three sections. We will begin by discussing the state of the oceans, and ecological differences between marine and terrestrial/aquatic systems. The second part of the course will discuss the major threats to ocean systems. The third part of the course will focus on solutions in terms of protected areas, management and policy strategies, and various aspects of the human dimension.

Also offered for undergraduate-level credit as ESM 483 and may be taken only once forcredit. .

## ESM 585 - Ecology and Management of Bio-Invasions (4)

Invasive, or nonindigenous, species present us with global ecological and economic problems and have been ranked as second only to habitat destruction as a threat to our natural areas and native species. These invasive species are a concern because they restructure ecosystems, affect the evolutionary trajectory of native species, lead to the extinction of species, and impact local industries.

Also offered for undergraduate-level credit as ESM 485 and may be taken only once for credit. .

ESM 587 - Environmental Justice (4)
Explores the foundations of environmental justice theory and how they apply to his torical, current and emerging global is sues. This course explores philosophies of justice and fairness as they relate to environmental 'goods' and 'bads.' We will explore a variety of case studies, touching on interrelated topics including food justice, climate and energy justice, water justice and infrastructure supply and demand, etc. This course blends sociological perspectives with natural resource management and policy implications. Expected preparation: ESM 335 or Geog 345U.
Also offered for undergraduate-level credit as ESM 487 and may be taken only once for credit.

ESM 588 - Environmental Sustainability (4)
Sustainability in natural and human-influenced ecosystems, with a focus on processes of regeneration, maturity, collapse and renewal. Topic areas include natural provisioning of ecosystemservices, processes of change in ecological systems, interactions among ecological and social systems, economic valuation of ecosystem services, and ecosystemmanagement.

## ESM 590 - Ecos ystem Services andSustainability: Developing a Toolkit (1)

Ecosystemservices provide a conceptual framework for addressing ecological, social and economic sustainability. Students will learn to use an interdisciplinary toolbox of methods and techniques useful for as sessing various aspects of ecosystemservices. Students will develop a project proposal on a real-world application of ecosystem services as sessments and valuation.

Also offered for credit as ESM 690 and may be taken only once for credit.

ESM 592 - Foundations of Social-Ecological Systems (4)
This theory and applications course acquaints students with key ecological, social, economic and philosophical theories underlying science and management of social-ecological systems. We explore a unify ing conceptual model connecting biophysical and social parameters linked by ecosystemservices, human perspectives, behaviors and institutional policies in coupled natural and human systems. This is the s ame course as ESR 692 and may be taken only once for credit.

Cross-Listed as:ESR 692.

## ESM 593 - Advanced Environmental ScienceLab and Field Methods (2)

Trains seniors and graduate students in skills that can be used in field and laboratory research. The specific
application and topics will rotate fromterm to term allowing students to learn skills necessary to their own research but als o to learn methods employed by other research groups in ESM.
Also offered for undergraduate-level credit as ESM 493 and may be taken only once for credit. Prerequisite: Senior or graduate standing.

## ESM 599 - Special Studies (1-8)

See department for course description. Consent of instructor and programdirector. (Credit to be arranged.)

## ESM 690 - Ecosystem Services andSustainability: Developing a Toolkit (1)

Ecosystemservices provide a conceptual framework for addressing ecological, social and economic sustainability. Students will learn to use an interdisciplinary toolbox of methods and techniques useful for as sessing various aspects of ecosystemservices. Students will develop a project proposal on a real-world application of ecosystem services as sessments and valuation.
Also offered for credit as ESM 590 and may be taken only once for credit.

## ESR - Environmental Sciences \& Res

## ESR 407 - Environmental Seminar (0-6)

Weekly seminar series involving student-led discussion of topical environmental is sues. May be repeated for up to 3 credits.

## ESR 507 - Seminar (1-6)

Weekly seminar series on topical environmental is sues. May be repeated for up to 3 credits.

## ESR 601 - Research (0-12)

Research that is not normally part of the thesis.

## ESR 602 - Independent Study (1-9)

(Credit to be arranged.)

## ESR 603 - Dissertation (1-12)

All aspects of thesis including thesis research and writing the dis sertation.

## ESR 604 - Cooperative Education/Internship (0-9)

(Credit to be arranged.)

## ESR 605 - Reading and Conference (0-12)

Scholarly examination of literature including discussion between student and professor.

## ESR 606 - Project (1-9)

(Credit to be arranged.)

## ESR 607 - Seminar (1-9)

Environmental Sciences Seminar. Consent of instructor. Pass/nopass only.

## ESR 610 - Selected Topics (1-12)

(Credit to be arranged.)

## ESR 630 - Introduction to Trans disciplinary Modes of Critical Inquiry and Science in Environmental Research (3)

This course draws on representatives fromresearch groups in the School to present the many ways to formulate questions and different forms of science that are being actively used to address environmental problems. We will explore curiosity-and problem-based approaches from social, physical and biological sciences.
Prerequisite: PhD student or MS with permis sion of instructor.

## ESR 655 - Science Communication (1)

Students will outline the objectives involved in presenting scientific information to different audiences, including the role of the speaker, visual presentation of data, written and mixed media. This is the same course as ESM 555 and may be taken only once for credit.
Cross-Listed as: ESM 555.

## ESR 656 - Advanced Communication Skills for Doctoral Students (1)

Students will explore more advanced topics on presentation and proposal preparation. All students will prepare a mocked up poster based on cognitive and graphic design principles. They will create an extended outline for a research proposal. Peers in class will critique posters and proposals. This is the same course as ESM 556 and may be taken only once for credit.

## ESR 657 - Science, Media and the Public: Working with the Media to Create Effective Scientific Messages (1)

Scientists need to explain their studies to the public through mass media. Topics include; audience, different media, the reporters' process, editor's view of science stories, and how inaccuracies get perpetuated. Students will evaluate a wide variety of mass media materials, interv iew practice, and guests' description of various media. This is the s ame course as ESM 557 and may be taken only once for credit.
Cross-Listed as: ESM 557.

## ESR 692 - Foundations of Social-Ecological Systems (4)

This theory and applications course acquaints students with key ecological, social, economic and philosophical theories underly ing science and management of social-ecological systems. We explore a unifying conceptual model connecting biophysical and social parameters linked by ecosystemservices, human perspectives, behaviors and institutional policies in coupled natural and human systems. This is the same course as ESM 592 and Soc 692 and may be taken only once for credit.
Cross-Listed as: ESM 592 and Soc 692.
ESR 699 - Special Studies (1-6)
(Credit to be arranged.)

## ETM - Engineering Management

## ETM 347U - Introduction to Product Design (4)

This course is geared to students interested in understanding products and their roles in ourculture and lives, and experiencing some of what is involved in their design and production. Course will reflect a multidisciplinary approach and will enhance students' teamwork experience, communication skills, and exposure to the various disciplines. Expected preparation: Unst 222 (SINQ) before or concurrently.

## ETM 356U- Introduction to Human-Centered Design

 (4)HCD is an approach that puts human needs, capabilities, and behaviors first, then designs to accommodate them. This course will build on the principles of Design Thinking to furtherstudents' knowledge and hands-on practice applied to the creation of products and services that enhance human experiences. Expected preparation: Unst 222 (SINQ) before or concurrently.

## ETM 410 -SelectedStudies (1-6)

(Credits to be arranged.)

## ETM 501 - Research (1-9)

(Credit to be arranged.)

## ETM 502 - Independent Study (1-9)

(Credit to be arranged.)

## ETM 503 -Thesis (1-9)

(Credit to be arranged.)

## ETM 504 - Cooperative Education/Internship (1-9)

(Credit to be arranged.)

## ETM 505 - Reading and Conference (1-6)

(Credit to be arranged.)

## ETM 506 -Special Projects (1-9)

(Credit to be arranged.)

## ETM 507 -Seminar (1-9)

(Credit to be arranged.)

## ETM 509-Practicum(1-9)

(Credit to be arranged.)

## ETM 510 -Selected Topics (1-6)

(Credit to be arranged.)

## ETM 511 - Technology Management Writing and Presentations (4)

Students will learn to develop written deliverables and presentations that professionaltechnology managers and leaders are called on to produce-reports, analyses, persuasive write-ups, announcements, presentations (prepared and impromptu), proposals and website content. Students will examine and critique examples of professional communications, as well as edit the works of others in the class. Emphas is on creativity, org anization,
voice, audience and objectives for the communications. Discussion topics also include professional writing standards-ethics, research and references, style considerations and requirements - as well as how to structure, org anize and present academic writing.

## ETM 518 - Ethical Issues in Technology Management (4)

Designed to meet the needs of engineers who are or will be moving into greater res ponsibility for management as they advance in the profession. Emphasizes the theory of ethical behavior as it relates to real world applications faced regularly in the business world today.

## ETM 519 - Human Side of Technology Management (4)

Introduction to leadership and human resource management is sues that technical managers are confronted with while managing their culturally diverse workforce of technicians, scientists and engineers.

## ETM 520 - Management of Engineering and

 Technology (4)Study of fundamental concepts of engineering and technology management to provide thestudents with an indepth understanding of the underlying principles of this discipline. Innovation process, technological change, motivation and leadership theories applicable to engineers and scientists, technological entrepreneurship, strategic management of technology and systeminterfaces in existing and emerging technologies are discussed. Ongoing engineering and technology management research is critically evaluated in classroomdiscussions. Case studies and team projects are included.

## ETM 522-Communication and Team Building (4)

Developing high performance teams for engineering- and technology-driven companies; fundamental concepts that make an effective team; building a high-performance team; the keys to high performance; converting risks into as sets; the power of commitment and discipline, and constructive communication; getting results through teamdynamics, creative problemsolving, and interactive exercises.
Prerequisite: graduate standing or consent of ins tructor.
ETM 525 - Strategic Planning (4)
Critical is sues in shaping the competitive strategy for the engineering- and technology-driven companies in a turbulent business environment; key steps and end results of the planning process; corporate mission; Key Result Areas (KRAs) and situational analysis including strengths,
weaknesses, opportunities, and threats in KRAs. Identifying planning assumptions, critical issues, setting objectives, formulating strategy. Leadership, organizational culture, and structure to support the implementation of a strategic plans well as the strategic controlsystems. Case studies, presentations, term projects, teamwork, and interactive exercises.

Prerequisite: graduates tanding or consent of ins tructor.

## ETM 526 -Strategic Management of Technology (4)

Analyses of the structure and competitive dy namics of technology-driven industries; resource- and knowledgebased frameworks for competitive advantage, which are applied to technology-driven industries; as well as a discussion of corporate, international and global strategies for technology-driven ventures.

## ETM 527 - Competitive Strategies in Technology Management (4)

Provides perspectives, theories and methods used to analyze, formulate and implement competitive strategies in technology intensive industries. Provides a his torical perspective on the evolution of competitive strategy theory and techniques including their foundations with key concepts and is sues fromstrategic management thought leaders and present examples of the application of those concepts in business situations. Covers frameworks and tools used forstrategy analysis, development and implementation.

Prerequisite: graduate standing or consent of instructor.

## ETM 530 -Decision Making (4)

Decision and value theory concepts are applied to technical and management decisions under uncertainty. Multicriteria decis ions are analyzed. Subjective, judgmental values are quantified for expert decisions and conflict resolution in strategic decisions involving technological alternatives. Hierarchical decision modeling approach is introduced. Individual and ag gregate decis ions are measured. Decision discrepancies and group disagreements are ev aluated. Case studies are included in the course.

## ETM 531 - Technology Assessment \& Acquisition (4)

Fundamental concepts of as sessing technologies including evaluation attributes and methodologies, impacts and impact relationships, and technology diffusion from individual, organizational, technical and market perspectives. Case studies, professional and research articles, and guest speakers fromlocal companies included.

## ETM 532 - Technology Forecasting (4)

Fundamental concepts of technology forecasting. Differences between ordinary forecasting and technology forecasting, objectives of technology forecasting, tools and methods and their applications, selection of the right forecasting methodology, planning for technology forecasting, identifying attributes for forecasting, and managing technology forecasting. Topics are discussed through case studies, professional and research articles, guest speakers fromlocalcompanies, and recently published books.

## ETM 533 - Technology Transfer (4)

Fundamental concepts of transferring technologies. Topics include university, industry and government collaboration for technology development, transfer of technologies from labs into product groups, research and development cons ortia, and international technology transfer. Case studies, professional and research articles, and guest speakers fromlocal companies included.

## ETM 534 - Technology Roadmapping <br> (4)

Introduces Technology Roadmapping (TRM), which provides a structured approach for exploring and communicating the relationships between evolving and developing markets, products and technologies over time. Roadmaps allow technology developments to be integrated with business planning, and the impact of new technologies and market developments to be assessed. Roadmaps also seek to capture the environmental landscape, threats and opportunities for a particular group of stakeholders in a technology or application area.

## ETM 535 - Advanced Engineering Economics (4)

Economic evaluation of engineering and $\mathrm{R} \& \mathrm{D}$ projects is covered from the engineering management viewpoint. Time value of money, taxcons iderations, break-even analys is, sensitivity analysis, projectevaluations under uncertainty, risk sharing, capital budgeting, fin ancial ratios, and cost estimating techniques are studied. A businesssimulation game is used throughout the course to gain a better understanding of financialdecision making.
Prerequisite: graduate standing or consent of instructor, knowledge of probability/statistics.

## ETM 536 - RDM: R\&D Management (4)

Managerial as pects of Research and Development (R\&D) including special is sues in managing research at national labs, university settings, and industry labs. Reviews evaluation methods and multiobjective analysis used for R\&D project selection. Development analyzed across the
following venues: Roadmap Development, Eco system Development, Platform Development, Product Development, Technology Development, Prototype Development, Initiative Development. Focus on integration of research and development functions; project management challenges resulting fromthe uncertain nature of R\&D; and the difficulties in measuring on-going R\&D outputs.

## ETM 537 -Benchmarking Using Data Envelopment Analysis (4)

This course focuses on data en velopment analysis, a powerful and flexible technique for quantitative benchmarking and productivity analysis. Applications and case studies froma wide range of areas including engineering, health care, education, financial services, new product development, technology forecasting, and nonprofit organizations will be included.

Prerequisite: graduates tanding or consent of ins tructor, linear programming.

## ETM 538 -Decision Support Systems: Data Warehousing (4)

Critical issues in developing data warehouse for decision support systems. Examines when and why an organization needs a data warehouse for decision support systems; how to org anize data in a data warehouse; complications in designing a data warehouse system; and identifying resources.

## ETM 540 - Operations Research (4)

Covers the use of operations research techniques in making engineering and technology management decisions. The primary emphas is is placed on applying and interpreting linear and integer programming. Problemformulations, mathematical model building, the basic principles behind the Simplex algorithm, and multiple objective linear optimization are included in the course. Post-optimality analys is is studied fromthe viewpoint of technology management. Other operations research techniques such as queuing models will also be covered. The course includes a term project involving an actual operations problem.
Prerequisite: graduatestanding or consent of instructor.

## ETM 543 - New Product Planning and Trend Foresight (4)

Covers activities and challenges of managing the planning stages of a new product. Introduces foresight methods for analyzing technology and market trends, including product-based scenario techniques. Introduces customer research techniques for opportunity recognition and methods for strategic product planning, product concept generation, and selection and definition of product
development projects. Covers org anizational principles and practices for early product planning and the role of product managers in sustain innovation.

## ETM 544 - Organizational Project Management (4)

Covers the strategic components which drive the integration of initiatives, goals and projects within an org anization. It involves the three primary domains of Portfolio, Programand Project Management. These domains support the management of business units, functions or company divisions and need to be in alignment for the business organization to be effective in pursuit of its vision. Includes coverage of macro level project management topics such as project management maturity models and the micro level such as agile project management.

## ETM 545 - Project Management (4)

Critical is sues in the management of engineering and high technology projects; analysis of time, cost, performance parameters fromthe organizational, people, and resource pers pectives; project planning evaluation and selection, including projectselection models; project and matrix organizations; project teams; scheduling and termination of projects. Casediscussions and termproject are included in the course.

## ETM 546 - Project Management Tools (4)

An in-depth study and review of the major problems and analytical techniques used in the planning and implementing of major industrial projects. Specific focus on three primary areas: (1) time management: network scheduling techniques, including CPM/PERT, Critical Chain, etc., (2) cost: earned value analysis, and (3) risk: management techniques such as Monte Carlo analysis. An emphas is is placed on the integration of the techniques in the areas. The contingency approach to designing a project management toolboxbased on the three areas of time, cost, and risk management is included.

Prerequisite: ETM 545 or project management experience.

## ETM 547 - New Product Development (4)

Examines complete product development process and key is sues in new product development critical to developing profitable products in today's technology oriented companies. Topics include technology integration, disruptive technologies, concurrent engineering, and creating innovative environments. Review of cases and published articles addressing these is sues. Students develop a plan for a new product including risk as sessments in areas such as manufacturing, design, and testing.

## ETM 548 -Managing New Technology Introduction (4)

Management procedures and key underlying concepts for effective planning, development, and introduction into volume production utilizing new technology are covered. Emphas is will be on semiconductor technology and manufacturing but most principles and methodologies are generally applicable to both hard ware and software.

## ETM 549 - Management of Technology Innovation (4)

Describes and explains phenomena pertaining to technologicalinnovation. Focus on the interplay between engineering/technology and the economical, cultural, psychological, social and technical as pects of the engineering environment. Provides technology managers a toolkit to make engineering and technical innovations successful. Also covers how en gineering and technology management enables technological innovation.

## ETM 550 - Manufacturing Systems Engineering (4)

Underlying concepts of manufacturing or production systems; product and process planning; job/flow shops; group technology, and flexible manufacturing cells.

Prerequisite: graduatestanding.

## ETM 551 - Manufacturing Systems Management (4)

Traditional and emerging techniques in manufacturing management; the evolution of concepts fromEOQ to MRP and JIT including what has gone wrong with them. Other management level is sues include aggregate production planning, enterpris erequirements planning, and concurrent engineering.

Prerequisite: Background in manufacturing at the level of ETM 550 or equivalent, or consent of instructor.

## ETM 553 - Manufacturing Systems Simulation (4)

Introduction of discretesimulation techniques for the modeling of randomprocesses and probabilistic events in the simulation of manufacturing systems; concepts of systems modeling with emphasis on the use of an animated simulation package throughout the course.

Prerequisite: graduate standing or consent of ins tructor, basic knowledge of probability and statistics.

## ETM 555 - Technology Marketing (4)

This course is designed to introducestudents to the special is sues faced by managers marketing technological products in markets characterized by rapid environmental change. Topics will include an examination of the marketing/engineering/manufacturing interface, product innovation strategies, value-based pricing, buyer behavior
and strategic selling, competitive market analy sis and positioning, and distribution strategies. Emphasis is placed on strategies for marketing technology products in industrial markets.

Prerequisite: graduate standing or consent of instructor.
ETM 556 - User-CenteredInnovation (4)
Introduction to the various streng ths and weaknesses of approaches to innovation. Focuses on a customer-driven methodology and introduces the increasingly prominent role of design in creating memorable experience, and emotional connection with a productand/or a company.

## ETM 558 - Engineering Financial Management (4)

Teaches key concepts of financial and cost management and their linkage to overall business strateg ies for nonfinancial managers. Emph asizes the educational needs and perspective of functional and project managers in engineering and research.

Prerequisite: graduate standing.

## ETM 559 - Global Management of Technology (4)

Explores issues associated with the management of technology-driven industries in a global setting. Strategic planning and management of technological innovation and commercialization are explored in selected countries, using processes in the US as benchmarks. A specific objective of this course is to explore ways to manage the development of competitive products or services, using project teams focused on one or more countries.

## ETM 560 - Total Quality Management (4)

Critical principles and procedures of quality management in a competitive global environment; contemporary definitions of quality; quality in production/services; quality economics; quality philosophies; planning, organizing, and controlling for quality; human resource and improvement strategies and QC tools. Case studies, presentations, termprojects, and teamwork.
Prerequisite: graduate standing or consent of ins tructor.

## ETM 561 - Technology Entrepreneurship (4)

Examines how to start and grow a high technology company orhigh technology venture. Covers the complete venture creation process: key issues in high tech markets, startup finance, growth strategies and exit strategies. Guest lectures by practicing entrepreneurs, executives and financiers. Student teams create a technology startup businessaround technology that they develop, write a businessplan and present their technology business idea to a financier.

## ETM 562 -New Venture Management (4)

Explores actualemerging technologies that are likely to impact or create technology-based industries in the next 15 years, and gives a framework for identifying, analyzing, acquiring, implementing and finally commercializing leading-edge technologies into new products or services.

## ETM 563 - Intrepreneurshipin Technology (4)

The development of new products and services is fundamental to sustaining a long-termcompetitive advantage. Theefforts of the individual or teamof entrepreneurs who are res ponsible for this activity become even more complex when the activity must be carried out inside an existing on-going business. Explores a procedural framework, along with typical is sues often encountered such as resources, timing, political conflicts, bureaucracy, and other obstacles that must be overcome to succeed in developing products within an existing company.
Prerequisite: Graduate standing. Expected preparation: ETM 555 and ETM 535.
ETM 565 - Research Methods for Engineering and Technology Management (4)
This course provides coverage of a range of techniques employed in technology management research and is sues confronting new researchers. It is open to students enrolled in graduate programs or considering Ph.D. programs both in ETM and from other departments. Statisticaltopics include a variety of statisticaltechniques including proper selection, use, and interpretation of parametric, nonparametric, and multivariate techniques. Additional topics covered include literature review methods and tools, hierarchy of research questions, survey design, research ethics, and visual dis play of quantitative information. Probability and statistics or consent of instructor.

## ETM 567 - Knowledge Management (4)

Introduction to some of the critical is sues and debates in knowledge management. Stresses the human and business as pects of knowledge management. Taught fromthe perspective of the user of technical tools and methods.

## ETM 568 - Energy Technology Innovations (4)

Reviews management of technology and innovation in the energy sector. Specifically, focuses on the technology development highlighting the uniquedifferences of the energy sector.
Prerequisite: graduatestanding.

## ETM 570 - Role of Government in Technology Management (4)

In their des ire to grow their nation's economies, governments often play an enormous role in fostering and regulating technology-related industries. Explores the connection between the GDP and its growth that is driven by technology and technology businesses.

## ETM 571 - Managing Emerging Technologies (4)

Explores 10 current emerging technologies that are likely to impact or create technology business industries in the next 5-10 years. Develops a framework for identifying, analyzing, implementing and finally commercializing leading-edge technologies into new products or services.

## ETM 573 - Management of Intellectual Capital (4)

Learn strategies that technology companies use to maximize profits through intellectual capital, with a focus on legally protected intellectual property. Understand that companies in different industries require different strategies. Learn how to research a company's intellectual capital and prepare an appropriate intellectual capital management plan.

## ETM 575 - Science and Technology Policy (4)

Presents concepts and techniques for analyzing and formulating national science \& technology policy, explains the process of transforming scientific knowledge into technical knowledge to design innovative products and services, and highlights the organizational interactions of research in science and technology to create national technical capabilities foreconomic development.
Prerequisite: graduate standing.
ETM 589 - Capstone Project (4)
For a course description, please contact the department.

## ETM 590 - Engineering and Technology Management Synthesis (4)

This is an alternate choice for the capstone course in the Master of Science in Engineering and Technology Management. It synthesizes the concepts and methodologies of engineering and technology management into an individual or group project. The research base for the project may come from any combination of the study areas covered in Engineering and Technology Management.
Prerequisite: Completion of at least seven courses in the MS ETM curriculumor permis sion of instructor.

## ETM 601 - Research (1-12)

(Credit to be arranged.)

## ETM 602 - Independent Study (1-4)

(Credit to be arranged.)

## ETM 603 -Dissertation (1-12)

(Credit to be arranged.)

## ETM 604 -Cooperative Education/Internship (1-9)

(Credit to be arranged.)

## ETM 605 - Reading and Conference (1-9)

(Credit to be arranged.)

## ETM 606 -Special Projects (1-6)

(Credit to be arranged.)

## ETM 607 -Seminar (1-9)

(Credit to be arranged.)

## ETM 610 -Selected Topics (1-9)

(Credit to be arranged.)

## FILM - Film

## FILM 130 - Introduction to Digital Filmmaking for Non-Film Majors (4)

A video production course for non-film-majors seeking a basic introduction to digital filmmaking technology and the film production process. Introduces students to the basic uses of current digital film equipment: cameras, lighting kits, editing software, and on-set safety procedures. Offers a survey of media landscapes (fiction, non-fiction, commercial, and experimental forms), production disciplines (live-action, animation, game design, virtual reality, visualeffects). There is no pre-requisite for the course.

## FILM 131 - Film Analysis (4)

An introductory course in film analys is with special emphas is on cinema as a dramatic art and concepts related to the formal analys is of film. Elements to be considered will include cinematography, performance, edited image, and sound. Selected films will be shown.

## FILM 132 - Introduction to Digital Filmmaking (4)

A video production course for film majors seeking a basic introduction to digital filmmaking technology and the film production process. Introduces students to the basic uses of current digital film equipment: cameras, lighting kits, editing software, and on-set safety procedures. Offers a survey of media landscapes (fiction, non-fiction, commercial, and experimental forms), production disciplines (live-action, animation, game design, virtual reality, visual effects)

Prerequisite: FILM 131.

## FILM 199 - Special Studies (1-12)

(Credit to be arranged.)

## FILM 231 - Film Analysis II (4)

Builds upon the concepts related to the formal analysis of film to hone students' critical writing skills. This is a writing-intensive course (WIC).
Prerequisite: FILM 131 and FILM 132, in which you must earn a minimum $\mathrm{C}+$ grade .

## FILM 257 - Narrative Film Production I (4)

An introductory study of writing, technical, aes thetic and org anizational principles of digital filmmaking in fictional narrative formats.

Prerequisite: FILM 131 and and FILM 132, in which you must earn a minimum C+ grade.

## FILM 258 - Documentary Film Production I (4)

An introductory study of aesthetic, technical, and contentrelated principles of digitalfilmmaking in nonfiction, documentary formats.
Prerequisite: FILM 131 and and FILM 132, in which you must earn a minimum $\mathrm{C}+$ grade.

## FILM 280 - Classical Film Theory (4)

Introduces the significant trends of the first fifty years of Western film theory via primary and secondary source essays. Topics may include realism, authorship, conceptions of modernist representation, and Soviet montage.

Prerequisite: FILM 131 and FILM 132, in which you must earn a minimum C+ grade.
FILM 299 -Special Studies (1-4)
(Credit to be arranged.)

## FILM 331 U - Understanding Movies (4)

An intermediate course in film appreciation with special emphasis on cinema as a dramatic art. Elements to be considered will include cinematography, performance, edited image, and sound. Selected films will be shown. Recommended prerequisite: upper-division standing.

## FILM 358 - Narrative Film Production II (4)

An intermediate study of writing, technical, aesthetic, and org anizational principles of digital filmmaking in fictional narrative formats.
Prerequisite: FILM 257.

## FILM 359 - Narrative Film Production III (4)

An advanced study of writing, technical, aes thetic, and organizational principles of digital filmmaking in fictional narrative formats.

Prerequisite: FILM 358.

## FILM 360 - Topics in Film Production (4)

Focused study of a variety of specialized skills and/or genres related to digital film production. Fromtermto term, topics might include: VisualEffects; Music Videos; Web Cinema; Advanced Directing; Producing. Course may be repeated for credit with different topics.
Prerequisite: FILM 131 and and FILM 132, in which you must earn a minimum C+ grade; FILM 257 or FILM 258.

## FILM 361 -Documentary Film Production II (4)

An intermediate study of aes thetic, technical, and contentrelated principles of digital filmmaking in nonfiction, documentary formats.

Prerequisite: FILM 258.

## FILM 362 -Documentary Film Production III (4)

An advanced study of aesthetic, technical, and contentrelated principles of digital filmmaking in nonfiction, documentary formats.

Prerequisite: FILM 361.

## FILM 363 - Topics in Experimental Film and Media Production (4)

Introduction to new scenarios for cinema and new reasons for deploying it in different spaces, particularly in public. In using various combinations of cameras, screens,
projectors, participants, and spaces it challenges students to design and construct moving image-based works that address unique historical, spatial, and social situations and struggles in public and semi-public spaces. This course is repeatable for up to 12 credits .

Prerequisite: FILM 131 and FILM 132, in which you must earn a minimum C+ grade; FILM 257 or FILM 258.

## FILM 364 -Sound: Production and Design (4)

Students will study and apply production and postproduction sound techniques for fiction and non-fiction film and video applications. The technical aspects and aes thetic considerations of storytelling through sound in lectures, screenings, demonstrations, exercises, creative projects, and class critiques will be as sessed. Topics include: principles of sound, production sound recording equipment, positioning microphones, audio software, sound mixing, effects editing, using music, editing dialogue, and careers in production and post-production audio.

Prerequisite: FILM 131 and FILM 132, in which you must earn a minimum C+ grade; FILM 257 or FILM 258.

## FILM 365 - Editing (4)

Introduction to the fundamental theories of fiction and non-fiction editing techniques, technologies, and skills required to produce well-edited work. Topics include rhythm, continuity, style, space, and motion contextualized within global film practices. Learn how to use editing to shape and structure moving images and sound to invest them with intention, narrative and meaning.
Prerequisite: FILM 131 and FILM 132, in which you must earn a minimum C+ grade; FILM 257 or FILM 258.

## FILM 366 - Digital Cinematography (4)

Students will study and apply camera and lighting techniques for fiction and non-fiction film and video applications. We will address the technical aspects and aes thetic considerations of visual storytelling through lectures, screenings, demonstrations, exercises, creative projects and class critiques. Topics include: preproduction vis ualization, methods for shooting coverage, principles of composition, employing 2D and 3D space, the moving camera, using available light, production lighting techniques, how focal length impacts the shot, controlling depth of field, and managingexposure.
Prerequisite: FILM 131 and FILM 132, in which you must earn a minimum C+ grade; FILM 257 or FILM 258.

## FILM 367 - Producing (4)

Requires students to explore the tools, techniques, and process a creative Producer of Film uses to launch a project in both studio and independent production environments. In service to this goal, students undertake a series of short writing projects, in-class writing exercises,
and oral presentations; and preparation of deliverables that include a production folder with a budget, script breakdown, schedule, call sheets, and a pitch deck.
Prerequisite: FILM 131 and FILM 132, in which students must earn a minimum of $\mathrm{C}+$; FILM 257 orFILM 258 , in which students mustearn a minimum of a C; Film major.

## FILM 368 - Visual Effects (4)

Requires students to engage with the fundamentals of visual effects production through industry standard software and exposes students to the basic language, techniques, and workflows involved in commercial, TV and feature film visual effects production.
Prerequisite: FILM 131 and FILM 132, in which students must earn a minimum of $\mathrm{C}+$; FILM 257 orFILM 258 , in which students mustearn a minimum of a C; Film major.

## FILM 370U- Topics in Film, Media, and Culture (4)

Study of a variety of cultural and historical issues as they relate to film, television, and other media. From quarter to quarter topics might include: Hitchcock, Queer Cinema, The Cinema of John Carpenter, Contemporary Documentary, Film Noir 1940 to 1960, Graphic Novels.

## FILM 374-Topics in Screenwriting (4)

Course in screenwriting involving short and long form screenplays, the analysis of narrative structure for the screen, and the practical application screenwriting techniques. Course may be repeated forcredit with different topics.
Prerequisite: FILM 131 and and FILM 132, in which you must earn a minimum $\mathrm{C}+$ grade .

## FILM 381 -Film History I (4)

A study of the evolution of film language from the silent era to the introduction of sound; how the influences of a broad rangeof cinematic art movements, including Expressionism, Impres sionism, Surrealismand Poetic Realism, contributed to the classical Holly wood style. Also examines the artistic, economic and technological forces that led to the Holly wood studio system and the popularity of genres such as the western, the musical and the gangster film.
Prerequisite: FILM 131 and FILM 132, in which you must earn a minimum C+ grade. Sophomore standing recommended. Corequisite: FILM 381L.

## FILM 381L - Lab for Film 381 (0)

Lab for Film 381.
Corequisite: FILM 381.

## FILM 382 - Film History II (4)

A study of the major artistic, economic and technological trends of motion picture production during the post-war era; how directors such as Hitchcock and Welles were able find a unique expres sion within the parameters of the clas sical style and the commercial pres sures of the studios. Explores how world cinema movements presented aesthetic and political challenges to the Hollywood model.
Prerequisite: FILM 131 and FILM 132, in which you must earn a minimum C+ grade. Sophomore standing recommended. Corequisite: FILM 382L.
FILM 382L - Lab for Film 382 (0)
Lab for Film 382.
Corequis ite: FILM 382.

## FILM 383 - Film History III (4)

A study of contemporary world film production fromthe struggles of an independent and avantgarde cinema to the CGI effects of today's blockbuster. Alsoexamines how world cinema production has adapted to new digital technologies and the demands of a global market.
Prerequisite: FILM 131 and FILM 132, in which you must earn a minimum C+ grade. Sophomore standing recommended. Corequisite: FILM 383L.

FILM 383L - Lab for Film 383 (0)
Lab for Film 383.
Corequis ite: FILM 383.

## FILM 384U- Topics in American Cinema and Culture (4)

Examines topics within American film/culture, including studies of specific industry practices, artis tic movements, and historical moments in American culture and cinema history.

## FILM 399-Special Studies (1-6)

(Credit to be arranged.)

## FILM 401 - Research (1-6)

(Credit to be arranged.)

FILM 402 - Independent Study (1-12)
(Credit to be arranged.)

## FILM 404 - Cooperative Education/Internship (1-12)

(Credit to be arranged.)

## FILM 405 - Reading and Conference (1-6)

(Credit to be arranged.)

## FILM 406 -Project (1-6)

(Credit to be arranged.)

## FILM 407 -Seminar (1-6)

(Credit to be arranged.)

## FILM 408-Workshop(1-6)

(Credit to be arranged.)

## FILM 409 - Practicum(1-12)

(Credit to be arranged.)

## FILM 410 -SelectedStudies (1-6)

(Credit to be arranged.)

## FILM 450 - Portfolio and Professional Development (4)

Requires students to investig ate their interests, values, personality, and skills as the basis for discovery and communication of their personal brand as they begin their careers. Students will generate a branded digital portfolio of their work that includes marketing materials and work samples. Topics include: building a personal brand, designing a website, identify ing areas of professional interest, assessing strengths, getting started on a career path, acquiring job search skills, interviewing, freelancing, and networking. This is an advanced production course.
Prerequisite: Permis sion fromthe instructor is required to register.

## FILM 451 - Advanced Production Workshop (4)

Provides an intensive production experience for advanced students who apply acquired skills to the creation of a significant, sophisticated short filmin a chosen genre. Students manage all aspects of production and generate marketing materials and a distribution plan for the finished film. In addition to producing their own work, students are required to crew on fellow class mates' projects and therefore exit the course with high quality assets to add to a reel or portfolio.

Prerequisite: Either FILM 359 orFILM 362.

## FILM 460 - Advanced Topics in Production (4)

Advanced study of a variety of specialized skills and/or genres related to digital film production. Fromtermto term, topics might include: Massive Media; Visual Effects; Music Videos; WebCinema; Urban Media. Course may be repeated forcredit with different topics.

Prerequisite: Either FILM 362, FILM 359 or permis sion from the instructor.

## FILM 480 - Contemporary Film Theory (4)

A survey of film theory and criticismfrom the 1960s to the presentday. Students are introduced to key concepts and major figures from Structuralism, Semiotics, Psychoanalysis, Feminism, and Narrative Theory.

Prerequisite: FILM 131, FILM 132, FILM 280 and junior standing or consent of instructor.
FILM 484 - Anatomy of a Movie (4)
Operates as a casestudy of one well known, critically acclaimed film, examining the industrial, technical, cultural, and artistic elements in the film's production, exhibition and reception. Topics include studio ideology and production strategies, the star system, and his toric context and meaning of films, independent cinema practices.
Prerequis ite: FILM 131 and and FILM 132, in which you must earn a minimum $\mathrm{C}+$ grade.

## FILM 486 - Topics in Film and the Moving Image (4)

Concentrated study of genre, structure and style of a particular period, topic and/or figure in film and the moving image; for example, '70's Film \& TV Renais sance, Irish Cinema, and/or Robert Altman.

Prerequis ite: FILM 131 and and FILM 132, in which you must earn a minimum C+ grade.

## FILM 487 - Topics in International Film and the Moving Image (4)

Concentrated study of national cinema (non-US) or national cinema movement. Students will cons ider the cinema in relation to: national context and cinematic history; other national/transnational cinemas; and independence and nationalism, cen sorship, and political and artistic movements. Examples include Irish Cinema, Italian Neorealism, and New Wave Cinemas.

Prerequisite: FILM 131 and and FILM 132, in which you must earn a minimum C+ grade.

FILM 501 - Research (1-12)
(Credit to be arranged.)

## FILM 504 -Internship(1-9)

(Credit to be arranged.)

## Fin - Finance

## Fin 199-Special Studies (1-4)

(Credit to be arranged.)

## Fin 218 - Personal Finance (4)

A survey of investments, budgets, reales tate ownership, financial institutions, consumers' credit, social security, stock market, mutual funds, and estate planning fromthe individual's point of view. Optional pass/no pass.

## Fin 301U - Introduction to Investing (4)

Investing is a means to help you meet specific financial goals, such as retirement, purchasing a house, or starting your own business. This class will introduce you to investing and help you understand the types of investment options available, their risks and returns, and how to create appropriate holistic investing strategies based on your investing goals. As part of a holistic strategy, the class will review such topics as taxefficient options, 529 plans, and 401 k plans. This class will also introduce a basic understanding of various investmentoptions including, but not limited to, mutual funds, ETFs, stocks, bonds, and cash. This class will discuss the various approaches for acquiring these investments. This will include a view of the impact of behavioral economics on investing as well as how technology is changed investing.

## Fin 310U- Entrepreneurial Finance and Accounting (4)

Introduction to the fundamental concepts of entrepreneurial finance and accounting. Covers the financial as pects of developing, financing, planning, managing, valuing and assessing new business ventures. Equips students with the quantitative, financial and accounting skills required to successfully develop, finance and manage a new venture.

## Fin 319 - Intermediate Financial Management (4)

Second level course in financial management to provide more depth in the study of asset pricing, capital budgeting, capital structure, dividend policy, working capital management, growth through mergers, and leasing. Emphas is on the development of problemsolving capabilities.
Prerequisite: BA 303.

## Fin 352 - Investments (4)

Analytical study of the principles of investment in stocks, bonds, and other security instruments. Includes background study of fin ancial markets and institutions; analys is of the investmentcharacteristics, valuation, and market price behavior of bonds and stocks, and the choice of appropriate portfolios of these securities. Also included is the study of information and market efficiency, term structure and the determination of market interestrates, and security valuation.
Prerequisite: BA 303.
Fin 399 - Special Studies (1-12)
(Credit to be arranged.)

## Fin 401 - Research (1-8)

(Credit to be arranged.)
Prerequisite: BA 303.

## Fin 404 - Internship (1-6)

(Credits to be arranged.)

## Fin 405 - Reading and Conference (1-8)

(Credit to be arranged.)
Prerequisite: BA 303.

## Fin 407 -Seminar (1-4)

Student-selected problems in business operation and businessmanagement to be studied by the individual and discussed in group meeting under direction of academic staff. (Credit to be arranged.)

## Fin 409-Practicum(1-12)

(Credit to be arranged.) Field work involving the practice of profes sional activities away from campus.
Prerequisite: consent of instructor.
Fin 410 - SelectedTopics (1-4)
(Credit to be arranged.) Consent of instructor.

## Fin 419 - Financial Data Analytics \& Modeling (4)

Applies analytical tools to analy ze big data around financial issues faced by analysts, corporate managers, fund managers, and investors. Lectures and cases/projects reinforce concepts and provide the foundation to analyze real financial problems around such is sues of estimating stock returns; stock risk; the effects of anti-takeover policies on corporate innovation; the influence of CSR
ratings on firms' market values; and the impacts of management compensation and board governance on firm performance.
Prerequisite: BA 303.

## Fin 431 - Financial Markets \& Institutions (4)

Introduces the operations, structure, and functions of financial markets and institutions and the important role they play in the financialdecision-making process of a firm. Emphas is on financial markets and the ag gregate economy, how these financial institutions meas ure and manage the unique risks to which they are exposed and the governing rules and regulations of financial markets and institutions that governhow risk is transferred.
Prerequisite: BA 303.

## Fin 439 - Real Estate Valuation I (4)

Fundamentals of appraising realestate, focusing on valuation techniques for income-producing real estate as sets. Analysis of income and expenses, net operating income, leveraged and unleveraged cash flows, debt coverageratios, direct capitalization, multipliers, and discounted cash flows. Marketability analysis, highest and best use concepts, zoning, environmental is sues, and the risks and rewards of real estate development are discussed.
Also offered for graduate-level credit as RE539 and RE 539S and may be taken only once for credit. Prerequisite: BA 303 or USP 233.

## Fin 441 - Fundamentals of Derivative Securities (4)

Options, futures, swaps, and other derivative securities. Principles of pricing; uses in speculation, hedging, and risk management, in both securities investment and corporate finance settings. Real options and option-like opportunities in business.
Prerequisite: Fin 319, Fin 352, Actg 381.

## Fin 449 - Valuation (4)

Principles of valuation, including valuations both internal and external to the business entity. Fin ancial planning, financial analysis, forecasting, and valuation. Students undertake and present a formal written valuation.
Prerequisite: Actg 381, Fin 319.

## Fin 456 - International Financial Management (4)

Development and study of a framework for the financial decisions of multinational businesses; management of working capital, investment and financing decisions of a firm in an international environment; foreign exchange markets, exchange risk, and internationaldiversification.
Also offered as graduate-level credit as Fin 556S and may be taken only once forcredit. . Prerequisite: Fin 319, Actg 381.

## Fin 457 - Real Estate Investment (4)

Study of fundamental concepts and analytical techniques of commercial real estate investment and finance. Includes characteristics of commercial real estate markets and real estate as a financial asset, real es tate investment strategies, pro-forma statements, mortgage financing and underwriting, real estate private equity and real es tate investment trusts (REITs). Places heavy emphasis on real world application and quantitative analysis to make real estate investment decisions.

Prerequis ite: Fin 319.

## Fin 465 - Finance Topics and Cases (4)

Case studies of financial problems in business including working capital management, capital budgeting, and financing is sues. Special topics covered will be at the discretion of the instructor.
Prerequisite: Actg 381, Fin 319 and 449.

## Fin 473 - Investment Analysis and Portfolio Management (4)

A study of the application of both portfolio theory and fundamental valuation techniques in security investment decisions. Students in this course serve as portfolio managers to a realdollar portfolio, providing security and sector oversight to the portfolio. The implications of modern portfolio theory for portfolio management and in portfolio performance evaluation are emphasized. This is the first class in a strongly recommended two-course sequence. Offered fall, winter, and spring terms .

Also offered for graduate-level credit as Fin 573 and may be taken only once for credit. . Prerequisite: Fin 352, Fin 449 , and instructor approval.

## Fin 474 - Portfolio Management: Issues and Performance Assessment (2)

This course is a continuation of Fin 573. Students will continue the responsibility of managing a real-dollar portfolio that was initiated in Fin 573. In addition, assessing and reporting on portfolio performance, and presenting a quarterly report to the investment community, will be an integral aspect of this course. This is the second course in a two-class course sequence. Offered winter, spring, and summer terms.
Also offered for graduate-level credit as Fin 574 and may be taken only once for credit. . Prerequisite: Fin 473 for 474, Fin 573 for 574.

Fin 501 - Research (1-8)
(Credit to be arranged.)

## Fin 502 - Independent Study (1-12)

(Credit to be arranged.)

## Fin 504 - Internship (1-8)

(Credits to be arranged.)

## Fin 505 -Reading and Conference (1-8)

(Credit to be arranged.)

## Fin 507 -Seminar (1-6)

(Credit to be arranged.) Student-selected problems in businessoperation and business management to be studied by the individual and discussed in group meeting under direction of academic staff.

## Fin 507S -Seminar (1-4)

(Credits to be arranged.)

## Fin 509 - Practicum(1-9)

(Credit to be arranged.) Field work involving the practice of profes sional activities away fromcampus.

Prerequisite: consent of instructor.

## Fin 510 -SelectedTopics (1-4)

(Credit to be arranged.) Consent of instructor.

## Fin 510S -SelectedStudies (1-4)

(Credit to be arranged.)

## Fin 513 - Financial Management (4)

Examines financialconcepts and problemsolving skills required to evaluate whether managerial decisions add value to the firm. Students will develop an understanding of financial implications of business decisions and a framework with which to evaluate their decisions. Ethical standards and long term value creation are integrated throughout thecourse.
Prerequisite: Actg 511.

## Fin 515 - Economics and Sustainability of the Firm (2)

Introduction to the principle concepts behind managerial economics, with an emphasis on the economics that lead to sustainable value creation for projects, firms and nations.

The focus is on microeconomics, or how individual- and firm-level decision-making can create (or destroy) value.

## Fin 516 - Managerial Macroeconomics (2)

Introduction to key concepts of macroeconomics, including monetary and fiscal policies and therelationships between inflation, interest and unemployment rates. Building from economic theory fundamentals, the course also examines how economics is linked to ecosystems and the roles of businessand government in fostering economic value creation and ecosystemstewardship.

## Fin 517 - Corporate Governance (2)

Survey of the role of culture and corporate governance in maximizing the value of a business. How corporate boards are led, focusing on the role of the director, shareholder rights, executive compensation, and the challenge of balancing the needs of shareholders, managers, and other stakeholders.

## Fin 521 - New Venture Finance (4)

Learn how early stage companies access capital for their new ventures, how investors evaluate potential investments, and considerations for structuring the financing.

## Fin 525 - Finance Capstone Project (2)

Course provides an opportunity to apply business knowledge to a comprehensive fin ance problem. Student teams will research, develop an analysis and make recommendations to professional/faculty panel. The type of project will vary but topics may include valuation, risk management, capital budgeting or portfolio management.
Prerequisite: Fin 513 or Fin 551.

## Fin 531 - Financial Institutions (2)

Introduces the role financial institutions play in financial markets, the structure of institutions and how they facilitate economic growth through the transfer of capital. The course then analyzes how institutions meas ure and manage the unique risks that they are exposed to through their ordinary operations.
Prerequisite: Fin 516 or concurrent enrollment.
Fin 535 - Financial Information Systems (2)
Study of financial information systems for operations and is sues encountered by financial analysts. Topics may include ERP systems, database, model building, the use of information for forecasting, and other topics associated
with the use of information systems to support financial analys is.

## Fin 540S - Real Estate Valuation II (4)

Principles of valuation applied in the context of realestate investments. Fin ancial strength analysis, cash flow estimation, determining the cost of capital, various discounted cash flow methods. Option valuation and real options approaches. Relative valuation approaches. Applied to the valuation of Real Estate Investment Trusts and other real estate developmententities.
Prerequisite: Fin 333, Fin 319.

## Fin 545 - Hedging and Risk Management (4)

Futures, options, swaps, and other derivative instruments, their characteristics, their uses in financialrisk management, and their effects in speculative situations; methodologies for valuation of derivatives. Exotic options, innovations in exotic derivatives and in the development and use of derivatives in corporate finance and investments. The rapid development of derivatives in domestic and international finance.
Prerequisite: Fin 513 or Fin 551.

## Fin 551 - Managerial Finance (4)

Gateway course to the Master of Science in finance. Examines the financial concepts and problem-solving skills required to evaluate whether managerial decisions add value to the firm. Students will develop an understanding of the financial implications of business decisions and a framework with which to evaluate their decisions. An integral part of this approach requires understanding how the different functional areas of a bus iness interrelate and the supporting role that finance provides. Topics considered include cash flow analysis, risk determination, valuation, working capital management, and financing. Graduate credit cannot be earned forbothFin 513 and Fin 551.
Prerequisite: Admission to the Master of Science in Finance program.

## Fin 552 - Investments (4)

Analytical study of the principles of investment in stocks, bonds, and other security instruments. Includes background study of financial markets and institutions; analys is of the investment characteristics, valuation, and market price behavior of bonds, stocks, and derivative securities, and the choice of appropriate portfolios of these securities. Also included is the study of information and market efficiency, termstructure and the determination of market interest rates, and security valuation.
Prerequisite: Fin 551 or Fin 513.

## Fin 552S - Investments (4)

Analytical study of the principles of investment in stocks, bonds, and other security instruments. Includes background study of financial markets and institutions; analys is of the investmentcharacteristics, valuation, and market price behavior of bonds, stocks, and derivative securities, and the choice of appropriate portfolios of these securities. Also included is the study of information and market efficiency, termstructure and the determination of market interest rates, and security valuation.
Prerequisite: Fin 452: BA 303, Actg 381 is strongly recommended; Fin 552: Fin 551 or Fin 513.

## Fin 553 - Valuation Modeling (2-4)

Builds on topics introduced in core graduate accounting and finance courses, using a modeling-driven approach to explore both technical and conceptual as pects of firm valuation. This is a practical and applied course that offers hands-on experience working with discounted cash flow models, constructing financial statement forecasts, constructing cost of capital estimates, and using techniques such as sensitivity, scenario, and Monte Carlo analysis to quantify the impact of modeling assumptions on results.
Prerequisite: Fin 551 or Fin 513.

## Fin 554 - Alternative Investments (2)

Introduction of alternative investments to traditional equity and fixed income securities. Students will learn about common types of alternative investments, valuation methods, unique risks and relation to traditional investments. Types of assets covered may include: real estate, private equity, venture capital, hedge funds, distressed securities and commodities.

Prerequisite: Fin 552 or approval of the instructor.

## Fin 555 - Quantitative Finance Methods (4)

Theory and application of empirical methods, including modeldevelopment, experimental design, and statistical analys is, applied to is sues in business, particularly the areas of accounting and finance. Construction and testing of hypotheses, analysis of variance, multiple regression, methods for dealing with problems in the distribution of data, time series, forecasting, and performanceevaluation. Publicly available data will be obtained and used by students.
Prerequisite: Fin 551 or concurrent enrollment orFin 513.

## Fin 556 - International Financial Management (4)

Development and study of a framework for the financial decis ions of multinational businesses; management of working capital, investmentand financing decisions of a firm in an international environment; foreign exchange markets, exchange risk, and international diversification.

Prerequisite: BA 303, Actg 381 for Fin 456; Fin 551 or Fin 513 for Fin 556.

## Fin 556S - International Financial Management (4)

Development and study of a framework for the financial decisions of multinational businesses; management of working capital, inves tment and financing decis ions of a firm in an international environment; foreign exchange markets, exchange risk, and international diversification.
Also offered as undergraduate-level credit as Fin 456 and may be taken only once for credit. . Prerequisite: BA 303 for Fin 456; 551 or Fin 513 for Fin 556.

Fin 559S - Advanced Real Estate Valuation (3)
Contact the department for a description of this class.

## Fin 562 - Intermediate Financial Management (4)

Second-level course in financial management to provide more depth in the study of asset pricing, capital budgeting, capital structure, dividend policy, working capital management, growth through mergers, and leasing. Emphas is is placed on the further development of problem solving capabilities.
Prerequisite: Fin 551 or Fin 513.

## Fin 565-Applied Financial Decisions (2-4)

This applied course aims to deepen understanding of the strate gic is sues and techniques associated with financial decisions using methods such as case and project analysis. Extensive spreadsheet modeling and risk-based tools are an integral part of the course. The perspective is that of the CFO decision maker, whose role has evolved to encompass not only financial, but strategic and stakeholder considerations. Topics may includesustainability and its application in finance, risk management, capital budgeting, financing decisions for established and entrepreneurial firms, special topics in firm valuation, working capital, and estimation of cost of capital. Due to the comprehensive nature of the issues addressed and methods employed, it is considered a capstone course and is bestcompleted towards the end of a students graduate program.
Prerequisite: Fin 551 or Fin 513.

## Fin 573 - Investment Analysis and Portfolio Management (4)

A study of the application of both portfolio theory and fundamental valuation techniques in security investment decisions. Students in this course serve as porffolio managers to a real dollar portfolio, providing security and sector oversight to the portfolio. The implications of modern portfolio theory for portfolio management and in portfolio performance evaluation are emphasized. This is the first class in a strongly recommended two-course sequence. Offered fall, winter, and spring terms.

Also offered for undergraduate-level credit as Fin 473 and may be taken only once for credit. . Prerequisite: Fin 319, Fin 449, and instructor approval for Fin 473; Fin 551 or Fin 513 for Fin 573; recommended Fin 553 at least concurrently for Fin 573.

## Fin 574 -Portfolio Management: Issues and Performance Assessment (2)

This course is a continuation of Fin 573. Students will continue the responsibility of managing a real-dollar portfolio that was initiated in Fin 573. In addition, assessing and reporting on portfolio performance, and presenting a quarterly report to the investmentcommunity, will be an integralaspect of this course. This is the second course in a two-class course sequence. Offered winter, spring, and summer terms.
Also offered for undergraduate-level credit as Fin 474 and may be taken only once for credit. . Prerequisite: Fin 473 for 474, Fin 573 for 574.

## Fin 575-Impact Ventures (2)

Provides hands-on experience with Impact Investing by working with regional entrepreneurs and investors to evaluate and fund early stage companies. Students will study venture capital and societal impact frameworks to develop specific investment proposals. No expected preparation required. Two credit course must be repeated for a total of six credits.

## Fin 577 -Derivatives and Financial Market Securities

 (2)Explores the financial markets and traded securities in the context of current market actions and past events. The main topics to be covered can be grouped Derivatives, and Fixed Income securities.
Prerequisite: Fin 551 or Fin 513.

## Fin 578 -Emerging Topics: FinTech (2-4)

Explores how financial technology trends and innovation are shaping the future of financial services, corporate finance, and investing. Students will attend weekly seminars where they will network with practitioners, ask questions, and learn how new technologies, regulations, and market forces are dis rupting finance and what career opportunities are emerging.

## Fin 579 - Case Competitions (2)

Acting as consultants, student teams solve a real-world finance problemin mergers and acquisitions, investment banking, financialadvis ory, and private equity: Participate in weekly discussions, teamwork, analysis, and presentation dry runs; presentto "the board" your analysis
and recommendation; build finance/strategic thinking, and communication/negotiation skills, and network.

Prerequisite: Fin 551 or Fin 513.

## Fin 599 - Real Estate Finance and Investment (3)

Application of finance and economic principles to analysis of realestate finance and investments. Emphasis on the development of problem solving capabilities through the use of computer application programs. Special attention is give to risk analys is, alternative mortgage instruments, hedging techniques, and the taxeffects of real estate investment.
Prerequisite: Fin 551 or Fin 513 or USP 598 or equivalent. This course may only be taken once for credit.

Finn - Finnish

## \$name

Finn 199 - Special Studies (1-5)
(Credit to be arranged.)

## \$name

Finn 299 - Special Studies (1-5)
(Credit to be arranged.)

## FPA - Fine and Performing Arts

## FPA 101 - Perspectives in the Arts (4)

This course is the foundational experience for the BA/BS in Arts Studies. The intention is to provide an introduction to fundamental methodologies and way s of thinking, that give students the tools to analyze and deconstruct works of art for meaning, function, success and value. The course will be composed of combinations of readings, activities and as signments, dis cussions, videos, slides and out of class performances, showings and exhibitions. Students will engage in the practice of making art as well as in exploring the relationships among the various art fields.

## FPA 199 - Special Studies (1-8)

(Credit to be arranged.)

## FPA 301 - Creative Thinking in the Arts (4)

Designed to introduce students to the theoretical context and practice of creative thinking. While affording freedom for discovery, this course will also offer a focused
perspective to strengthen creative thinking, define personal process, construct effective strategies for collaboration, and develop a creative project. Each student works to identify, access and broaden individual creative abilities. Each ses sion includes practical application of a variety of creative techniques, including artistic, expressive and interdisciplinary strategies; explorations in mind/body connection; sensory and visualization exercises; and activities which utilize multiple intelligences. Intellectual understanding emerges fromboth theory and historical context, but will be developed primarily through a regime of self-understanding and activity.

## FPA 399 - Special Studies (1-8)

(Credit to be arranged.)

## FPA 445 - Senior Project (4)

Focuses on the body of coursework undertaken in the BA/BS Arts Studies curriculumin an original creative work or comparable experience. This work may take the form of a performance, (with the student as creator/producer and/or performer), or a written thesis, gallery exhibition, internship (including but not limited to teaching), media work, practicum, or some other acceptable format.

## Fr - French

## Fr 101 - First-Year French Term 1 (4)

An introduction to elementary French. Emphasis on listening comprehension and oral practice, including the elements of grammar, vocabulary building, and elementary readings. This is the first course in a sequence of three: Fr 101, Fr 102, and Fr 103.

## Fr 102 - First-Year French Term 2 (4)

An introduction to elementary French. Emphasis on listening comprehension and oral practice, including the elements of grammar, vocabulary building, and elementary readings. This is the second course in a sequence of three: Fr 101, Fr 102, and Fr 103.

## Fr 103 - First-Year French Term 3 (4)

An introduction to elementary French. Emphasis on listening comprehension and oral practice, including the elements of grammar, vocabulary building, and elementary readings. This is the third course in a sequence of three: Fr 101, Fr 102, and Fr 103.

## Fr 105 - French Film (1)

Initiation to French culture and listening skills through short lectures in English and feature length film screenings in French (with English subtitles). Cannot be taken simultaneously with $\operatorname{Fr} 305$.

## Fr 150 - First-year French (Intensive) (6)

A two-termcourse covering the content of Fr 101, 102, 103.

## Fr 151 - First-year French (Intensive) (6)

A two-termcourse covering the content of $\operatorname{Fr} 101,102$, 103.

## Fr 199 -Special Studies (1-12)

(Credit to be arranged.)

## Fr 201 -Second-Year French Term 1 (4)

Intens ive review of basic materials introduced in FirstYear French and further development of communication skills. This is the first course in a sequenceof three: Fr 201, Fr 202, and Fr 203. Expected preparation: Fr 103.

## Fr 202 -Second-Year French Term 2 (4)

Intensive review of basic materials introduced in FirstYear French and further development of communication skills. This is the second course in a sequence of three: Fr 201, Fr 202, and Fr 203. Expected preparation: Fr 201.

## Fr 203 - Second-Year French Term 3 (4)

Intens ive review of basic materials introduced in FirstYear French and further development of communication skills. This is the third course in a sequence of three: Fr 201, Fr 202, and Fr 203. Expected preparation: Fr 202.

## Fr 299 -Special Studies (1-12)

(Credit to be arranged.)

## Fr 301 - Third-Year French Term 1 (4)

Development of speaking, listening, reading and writing skills and a review of grammar through study of appropriate texts, conversation, activities, and written
as signments. This is the first course in a sequence of three: Fr 301, Fr 302, and Fr 303. Expected preparation: Fr 203.

## Fr 302 - Third-Year French Term 2 (4)

Development of speaking, listening, reading and writing skills and a review of grammar through study of appropriate texts, conversation, activities, and written as signments. This is the second course in a sequence of three: $\operatorname{Fr} 301$, Fr 302, and Fr 303. Expected preparation: Fr 203.

## Fr 303 - Third-Year French Term 3 (4)

Development of speaking, listening, reading and writing skills and a review of grammar through study of appropriate texts, conversation, activities, and written assignments. This is the third course in a sequence of three: Fr 301, Fr 302, and Fr 303. Expected preparation: Fr 203.

## Fr 305 - Topics in French Film (4)

Focus on conversation and writing skills through the viewing and discussion of films. Topics may include: the history of French and Francophone cinema; the history of France through film. Expected preparation: Fr 203 and 4 hours of 300-levelFrench.

## Fr 320 - French for the Working World (4)

Intensive application of language for advanced everyday proficiency, career exploration, job seeking and development of an actual student-run company. Participants will practice and improve their language skills by using them to develop product ideas, conduct market research and sales campaigns, manage company finances and plan the future of the enterprise. Expected preparation: Fr 203 or equivalent proficiency.

## Fr 325 - French Phonetics and Phonology (4)

Introduction to the sounds of French: their place and manner of articulation (phonetics) as well as how they pattern with respect to each other and as influenced by morphological and syntactic factors (phonology). Expected preparation: Fr 301 or Fr 302.

## Fr 326 - French Conversation (4)

Developing speaking and listening skills in French. Some grammar review and readings to stimulate discussions.
Prerequisite: Fr 203.

## Fr 330-Topics in Culture and Civilization (4)

The development of French life, thought, and arts of different periods, fromthe Middle Ages to the 20th century: for example, Pre- Revolution, Revolution through 19th century, and contemporary. Expected preparation: Fr 203. 4 hours of 300 -level French.

## Fr 335U-19th Century France (4)

French politics, society and their reflections in literature from the Revolution to the 3rd Republic (1789-1890s). Main themes: ancien regime, Revolution, French political instability, rise of the bourgeoisie, growth of working class, reflection of these themes in major literary works. Conducted in English. Expected preparation: Hst 103 or UnSt 226.

## Fr 340 - Fundamentals of French Literary Studies (4)

Introduction to the study of French literature, its forms, genres, techniques, and themes, and to French literary criticism. Focus is on the practice of writing literary commentary, analysis and criticismin French.
Recommended prior to or concurrently with Fr341U, Fr 342U, or Fr 343U. Expected preparation: Fr 203; Fr 301 or Fr 302 strongly recommended.

## Fr 341U- Literature and Culture of the Middle Ages and Renaissance (4)

Focusing on cultural, political, and social realities, this course introduces students to literature fromFrance from the Middle Ages and the Renaissance. Readings include poetry, theater, and prose fromrepresentative authors as well as secondary texts that address authors, movements, and/or contexts. This course can betaken individually. Expected preparation: Fr 203; Fr 301 orFr 302 strongly recommended.

## Fr 342U- Literature and Culture of the Seventeenthand Eighteenth-Centuries (4)

Focusing on cultural, political, and social realities, this course introduces students to literature fromFrance from the seventeenth and eighteenth centuries. Readings include theater, prose, and poetry fromrepresentative authors as well as secondary texts that address authors, movements, and/or contexts. This course can betaken individually. Expected preparation: Fr 203; Fr 301 or Fr 302 strongly recommended.

## Fr 343U - Literature and Culture 19th and 20th (4)

Focusing on cultural, political, and social realities, this course introduces students to literature fromFrance from the nineteenth and twentieth centuries. Readings include poetry, theater, and prose fromrepresentative authors as well as secondary texts that address authors, movements, and/or contexts. This course can be taken individually. Expected preparation: Fr 203; Fr 301 or Fr 302 strongly recommended.

## Fr 344 - Literature and Cultures of the Francophone World (4)

Focusing on cultural, political, and social realities, this course introduces students to literature in French from French-speaking areas outsideof France. Readings include poetry, theater, and prose fromrepres entative authors as well as secondary texts that address authors, movements, and/or contexts. This course can betaken individually. Expected preparation: Fr 203; Fr 301 or Fr 302 strongly recommended.

Prerequisite: Fr 203.

## Fr 399-Special Studies (1-8)

(Credit to be arranged.)

## Fr 401 - Research (1-6)

(Credit to be arranged.)

## Fr 404 - Cooperative Education/Internship (1-12)

(Credit to be arranged.)

## Fr 405 - Reading and Conference (1-6)

(Credit to be arranged.)

## Fr 407 -Seminar (1-6)

(Credit to be arranged.)

Fr 408 - Workshop(1-6)
(Credit to be arranged.)

Fr 409 - Practicum (1-12)
(Credit to be arranged.)

## Fr 410 -SelectedTopics (1-6)

(Credit to be arranged.)

## Fr 411 - Advanced French (4)

In this coursestudents study and analyze a variety of documents (audio, video, texts, etc) on various topics to better understand the intricacies of spoken and written French. Great importance will be given to stylistic and to creative and rigorous application of grammatic al principles in different situations and genres.

Prerequisite: 8 credits of the Fr 301, Fr 302, Fr 303 sequence.

## Fr 412 - Creative Writing in French (4)

Sty listic and grammatical elements of several written genres will be analyzed in terms of why certain linguistic devices are used in particular genres and what effects they have on textual meaning. After analyzing and gaining familiarity with these features, students will create their own French texts.

Prerequisite: 8 credits of the Fr 301, $\operatorname{Fr} 302$, Fr 303 sequence.

## Fr 414 - Advanced French Grammar (4)

A systematic approach to the study of French grammar and syntax for majors and prospective teachers.
Also offered for graduate-level credit as Fr 514 and may be taken only once for credit. . Prerequisite: Fr 303. .

## Fr 415 - Business French (4)

Advanced work in the language of business and economics. Recommended prerequisite: Fr 303.

## Fr 417 - Translation (4)

Special problems of translating between French and English based on a variety of texts, both literary and nonliterary. Expected preparation: Fr 303.
Also offered for graduate-level credit as Fr 517 and may be taken only once for credit. .

## Fr 419-Medieval French Literature (4)

Selected works of Old French literature (reading in modem French translation). Expected preparation: at least 8 credits from Fr 341, 342, 343.

Also offered for graduate-level credit as Fr 519 and may be taken only once for credit. .

## Fr 420 - Renaissance French Literature (4)

Selected works of literature representative of the French Renais sance. Expected preparation: at least 8 credits from Fr 341, Fr 342, Fr 343.
Also offered for graduate-level credit as Fr 520 and may be taken only once for credit. .

## Fr 421 -Seventeenth-century French Literature (4)

Readings frommajor classical writers fromthe era of Louis XIV. Expected preparation: at least 8 credits fromFr 341, Fr 342, or Fr 343.

Also offered for graduate-level credit as Fr 521 and may be taken only once for credit. .

## Fr 423 - Fighteenth-century French Literature (4)

Reading, analysis and critique of the major works written in the Age of Enlightenment. Expected preparation: at least 8 credits fromFr 341, 342, or 343.
Also offered for graduate-level credit as Fr 523 and may be taken only once for credit. .
Fr 427 - Nineteenth-century French Literature (4)
Selected works of prose, poetry, and drama fromthe 19th century writers. Expected preparation: at least 8 credits from Fr 341, 342, or 343.

Also offered for graduate-level credit as Fr 527 and may be taken only once for credit. .

## Fr 428 - Nineteenth-century French Literature (4)

Selected works of prose, poetry, and drama fromthe 19th century writers. Recommended prerequisites: at least 8 credits fromFr 341, 342, or 343.

## Fr 433 - Twentieth-century French Literature (4)

Readings in poetry, drama, and prose. Expected preparation: at least 8 credits fromFr 341,342 , or 343.
Also offered for graduate-level credit as Fr 533 and may be taken only once for credit. .

## Fr 434 - Twentieth-century French Literature (4)

Readings in poetry, drama, and prose. Expected preparation: at least 8 credits fromFr 341, Fr 342 , or Fr 343.

## Fr 435 - Francophone Literature of the 20th Century

 (4)Readings in 20th century literature of French expres sion from outside metropolitan France: i.e., Africa, Quebec, and the Caribbean. Expected preparation: at least 8 credits from Fr 341, Fr 342, or Fr 343.

Also offered for graduate-level credit as Fr 535 and may be taken only once for credit. .

## Fr 441U- Major Works In Translation (4)

Study of texts representative of major French authors, periods, themes or genres in translation: such topics as Classical drama, Realism, contemporary novel, Flaubert, and Camus. Readings, lectures, and dis cussions in English. Expected preparation: 4 credits of upper division literature.
Also offered for graduate-level credit as Fr 541 and may be taken only once for credit. .

## Fr 445 - Representations of War in French Cinema (4)

Explores representations of WWI, WWII and the Algerian W ar in French films. Combines methods of film analysis and historical inquiry to understand nuances of representations of everyday life during conflicts - methods and skills that students will learn and apply throughout the quarter. Taught in French.
Also offered for graduate-level credit as Fr 545 and may be taken only once for credit. Prerequisite: Fr 303.

## Fr 490 - History of the French Language (4)

Study of the development of the French language in terms of phonological, morphological, and syntactical changes. Expected preparation: Fr 303.

Also offered for graduate-level credit as Fr 590 and may be taken only once for credit. .

## Fr 494 - French Linguistics (4)

Introduction to the basic concepts of linguistics and their application to the French language. Emphasis on practical analys is of the sound and the grammatical systems. Brief survey of the historical development, followed by an analys is of the phonetics, phonemics, morphology, and syntax of modern French. Conducted in English. Recommended prerequisites: $\operatorname{Fr} 303,325$.

## Fr 497 - Applied French Linguistics (4)

A practical application of linguistics to modern French. Emphas is on a contrastive analy sis of the structures of French and English. Recommended prerequisites: Fr 303 and 4 credits of linguistics.

## Fr 501 - Research (1-9)

(Credit to be arranged.)

Fr 503 - Thesis (1-9)
(Credit to be arranged.)

Fr 504 - Cooperative Education/Internship (1-9)
(Credit to be arranged.)

## Fr 505 - Reading and Conference (1-6)

(Credit to be arranged.)

## Fr 507 -Seminar (1-6)

(Credit to be arranged.)

Fr 508 - Workshop(1-6)
(Credit to be arranged.)

## Fr 509 - Practicum (1-9)

(Credit to be arranged.)

## Fr 510 -Selected Topics (1-6)

(Credit to be arranged.)

## Fr 511 - Advanced French (4)

In this course students study and analyze a variety of documents (audio, video, texts, etc) on various topics to better understand the intricacies of spoken and written French. Great importance will be given to stylistic and to creative and rigorous application of grammatical principles in different situations and genres.
Prerequisite: 8 credits of the Fr 301, Fr 302, Fr 303 sequence.

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A systematic approach to the study of French grammar and syntax for majors and prospective teachers.

Also offered as undergraduate-level credit as $\operatorname{Fr} 414$ and may be taken only once for credit. .

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Advanced work in the language of business and economics. Recommended prerequisite: Fr 303.

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Special problems of translating between French and English based on a variety of texts, both literary and nonliterary.
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Selected works of Old French literature (reading in modem French translation).
Also offered for undergraduate-levelcredit as Fr 419 and may be taken only once for credit. .

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Also offered for undergraduate-levelcredit as Fr 420 and may be taken only once for credit. .
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Readings frommajor classical writers fromthe era of Louis XIV.

Also offered for undergraduate-levelcredit as Fr 421 and may be taken only once for credit. .

## Fr 523 - Eighteenth-century French Literature (4)

Reading, analysis and critique of the major works written in the Age of Enlightenment.
Also offered for undergraduate-levelcredit as Fr 423 and may be taken only once for credit. .

Fr 527 -Nineteenth-century French Literature (4)
Selected works of prose, poetry, and drama fromthe 19th century writers.
Also offered for undergraduate-levelcredit as Fr 427 and may be taken only once for credit. .

## Fr 528 - Nineteenth-century French Literature (4)

Selected works of prose, poetry, and drama fromthe 19th century writers. Recommended prerequisites: at least8 credits fromFr 341, 342, or 343.

## Fr 533 - Twentieth-century French Literature (4)

Readings in poetry, drama, and prose.

Also offered for undergraduate-level credit as Fr 433 and may be taken only once for credit. .

## Fr 534 - Twentieth-century French Literature (4)

Readings in poetry, drama, and prose. Expected preparation: at least 8 credits fromFr $341, \mathrm{Fr} 342$, or Fr 343.

## Fr 535 - Francophone Literature of the 20th Century (4)

Readings in 20th century literature of French expression from outside metropolitan France:i.e., Africa, Quebec, and the Caribbean.
Also offered for undergraduate-level credit as Fr 435 and may be taken only once for credit. .

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Study of texts fromthe French middle ages. Readings, lectures, and discussions in English. Expected preparation: 4 credits of upper division literature.

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Explores representations of WWI, WWII and the Algerian War in French films. Combines methods of film analysis and historical inquiry to understand nuances of representations of everyday life during conflicts -methods and skills that students will learn and apply throughout the quarter. Taught in French.
Also offered for undergraduate-level credit as Fr 445 and may be taken only once for credit. Prerequisite: Fr 303.

## Fr 551 - French Poetry (4)

Study of French poetry. Analysis of formand content.

Fr 552 - French Drama (4)
Critical study of representative works of French drama.

## Fr 553 -French Prose (4)

Study of representative works of French fiction according to genre, period, theme, or authors.

## Fr 584 -French Stylistics (4)

A study of vocabulary, sentence structure, metaphor, and other elements that characterize the style of a writer, a period, or a movement.

## Fr 590 - History of the French Language (4)

Study of the development of the French language in terms of phonological, morphological, and syntactical changes.
Also offered for undergraduate-levelcredit as Fr 490 and may be taken only once for credit. .

## Fr 594 -French Linguistics (4)

Introduction to the basic concepts of linguistics and their application to the French language. Emphasis on practical analys is of the sound and the grammatical systems. Brief survey of the historical development, followed by an analys is of the phonetics, phonemics, morphology, and syntax of modern French. Conducted in English. Recommended prerequisites: $\operatorname{Fr} 303,325$.

## Fr 597 - Applied French Linguistics (4)

A practical application of linguistics to modern French. Emphas is on a contrastive analy sis of the structures of French and English. Recommended prerequisites: Fr 303 and 4 credits of linguistics.

## G - Geology

## G 199 -Special Studies (1-3)

See department for course description. (Credit to be arranged.)

## G 200 -Field Studies (1)

Participation in field trip exercises to enhance the understanding of materials and processes taught in corresponding lower division geology courses. Field studies areas include: coast, mountains, Portland area, Eastern Oregon, etc. Lecture, field trip, and completion of workbook orresearch paper required. Maximum of one credit in each field studies area.

Prerequisite:Previous or concurrentenrollment in the corresponding lower-divis ion geology course.

## G 201 -Dynamic Earth: Interior (3)

Explores the Earth's structure and composition, why continents and oceans form, and how plate tectonics provide a unifying model to explain geological
observations. Topics include the concept of deeptime, the relationship between geology and topography, plate tectonics, volcanism, earthquakes, magnetism, rocks and minerals, mountain building, basin formation. This is the first course in a sequence of two: G201 and G 202.
Corequisite: G204.

## G 202 -Dynamic Earth: Surface (3)

Explores how weather and climate alter the Earth's surface and landscapes over time due to rock weathering, mountain building, the action of streams, glaciers, wind, and ocean waves and currents. Embedded in these topics is the discussion of human practices impacting the natural environment. This is the second course in a sequence of two: G 201 and G 202.

## G 203-Historical Geology (3)

Earth's history as revealed through the rock and fossil record. Emphas is on the physical and biological changes exhibited through time. Recommended prerequisites: $G$ 201, G 202. Requires concurrentenrollment in G 206.
Corequisite: G206.

## G 204 - Geology Laboratory (1)

Laboratory work to accompany G201 and 202, respectively, involving basic geologic principles and processes emphasizing rocks, minerals, topographic and geologic maps. One 2-hour laboratory period. Concurrent enrollment in G 201, 202, respectively, is required.

Corequisite: G201.

## G 205 - Geology Laboratory (1)

Laboratory work to accompany G 201 and 202, respectively, involving basic geologic principles and processes emphasizing rocks, minerals, topographic and geologic maps. One 2 -hour laboratory period. Concurrent enrollment in G 201, 202, respectively, is required.

Corequisite: G202.

## G 206 -Historical Geology Lab (1)

Earth's history as revealed through the rock and fossil record. Emphas is on the physical and biological changes exhibited through time. Lab exercises stress the studies of fossils. Concurrent enrollment in G 203 required.
Corequisite: G203.

## G 207 - Computer BasedGeology Laboratory (2)

Laboratory work to accompany G202 involving the application of Microsoft Excel, Micros oft Access, and ArcView GIS to solve geoscience problems. One 3-hour laboratory period. Concurrent enrollment in G202 is required.

Corequisite: G202.

## G 301 - Geology for Engineers (3)

A study of the origin, interior, and crustal materials of the Earth: the natural processes which have built it up, deformed, and torn down the crust throughout geologic time: the environmental interrelationships between man and geologic processes and resources stressing application to engineering. For majors in civil engineering.

## G 312-Mineralogy (3)

Description, clas sification, and genesis of minerals and their importance for understanding the make up of the Earth and planets, mineral resources, and industrial applications.
Prerequisite: CH221. Corequisite: G313.
G 312L - Mineralogy Lab (0)
Lab for G 312.

## G 313-Methods in Mineralogy (2)

Analytical and imaging methods to evaluate a range of physical and chemical properties of minerals such as morphological features, quantitative evaluations of chemical constituents, and determination of crystal structures used for mineral identification.

Prerequisite: one year of general chemis try. Corequisite: G 312. Corequisite: G312.

## G 314 -Petrology (3)

Origin, classification, and dis tribution of igneous, metamorphic, and sedimentary rocks. Composition of the Earth's crust and mantle. Emphasis on rock type assemblages and their genesis occurring at major plate tectonic environments as represented by active/passive continental margins, rift zones, ocean basins and trenches, ocean is lands, continent-continent collision belts, and stable cratons.

Prerequisite: G312. Co-requisite: G315. Corequisite: G 315.

## G 314L-Lab for G 314 (0)

Lab for G 314.
Corequisite: G314.

## G 315 -Lithology and Petrography (2)

Description of the physical characteristics of naturally occurring rocks in hand specimen and thin section under the petrographic microscope. Understanding textures and fabrics of rocks and what physical and chemical parameters control themsuch as crystallization and
nucleation rate, compositional en vironment, stress field, and provenance characteristics.

Prerequisite: G312, G 313. Corequisite: G314. Corequisite: G314.

## G 318 - Processes in the Surface Environment (3)

Physical processes occurring in the upper crust including tectonic provenances, weathering, mass transport, fluidsediment tran sport, depositional environments, stratigraphic sequences, and intrastratal diagenesis.
Prerequisite: G201/204 and G202/205. Co-requisite: G319. Corequisite: G319.
G 318L - Lab for G 318 (0)
Lab for G 318.
Corequisite: G318.

## G 319 - Processes in the Surface Environment: Methods (2)

Introduction to methods of investigation of physical processes occurring in Earth's upper crust. Topics include design and use of environmental sensors, landscape analysis us ing digital data sets, and scale model experiments.
Prerequisite: G201/204 and G202/205. Corequisite: G 318. Corequisite: G318.

## G 322-Global Biogeochemical Cycles (5)

A survey course in biogeochemis try froman earth history perspective. Study of the origin and evolution of Earth and its biogeochemical cycles; survey of the microbial and chemical reactions that occur within the atmo sphere, lithos phere, hydrosphere and the biosphere; study of the mechanistic understanding of biogeochemical interactions to a large-scale, synthetic view of global biogeochemical cycles. Three 65 -minute lectures and one 2-hour laboratory.
Prerequisite: one year of chemistry. Corequisite: G322L.
G 322L-Lab for G 322 (0)
Lab for G 322.
Corequisite: G322.

## G 324 - Data Management and Analysis (5)

Application of digital computers to problems in geology through familiarization with software and hard ware for collecting, processing, analyzing, and presenting data. Topics covered include use of databases, spreadsheets, programming, analysis of data collected along a traverse, over a map area, and multivariate data. Applications to stratigraphic sections, chart recordings, sample locations, mapping, trend surfaces, and clustering. Three lectures and two 2-hour laboratories.

Prerequisite: Mth 252. Corequisite: G324L.

## G 324L - Lab for G 324 (0)

Lab for G 324.
Corequisite: G324.
G 331L - Paleontology Lab (0)
(Credit to be arranged.)
Corequisite: G331.

## G 333 -Evolutionary Concepts (4)

Designed to provide background in evolutionary concepts and to address current is sues in evolution as they are perceived and are being investigated by scientists in biology and geology. This is a combined lecture and discussion class and will include occasional guest lecturers presenting their research and views on various topics in evolution.

## G 340U-Life of the Past (4)

Origin and development of plants, invertebrate and vertebrate animals on Earth, as interpreted from the study of fossils and the sedimentary rocks in which they occur. Includes plate tectonics and basic geologic principles.
Prerequisite: upper-division standing.

## G 341U - Geology of the Oregon Country (4)

Origin and geologic history of Oregon. Focus on volcanic and surface processes as well as geologic hazards. Survey of fossils as environmental indicators.

Prerequisite: upper-division standing.

## G 342U- Volcanoes and Earthquakes (4)

A study of volcanoes andearthquakes as they affect humans and the development of landscapes. Prerequisite: upper division standing.
Prerequisite: Upper-division standing.

## G 344U-Geology and the National Parks (4)

Covers the geology that one finds in our national park system. Parks will be grouped by similar geology. Bas ic concepts of geology will first be covered in each group and then each park of the group discussed.
Prerequisite: upper division standing.

## G 345L - Lab for G 345U(0)

Lab for G 345.
Corequisite: G345U.

## G 345U - Life in the Universe (4)

Focus on issues surrounding the origin and evolution of life on Earth, the environmental conditions required for life elsewhere, and the potential for life on other planets and satellites in our solar system. Additional topics include the discovery, occurrence and habitability of extras olar planets, and the philosophical and societal implications of searching for life beyond Earth.
Prerequisite: upper division standing. Two lectures, one2hour laboratory. Corequisite: G 345L.

## G 346 - Exploring Mars (4)

On-line course centered on the ongoing exploration of Mars. Topics follow an exploration timeline and include Mars' geology, climate, potential for life, and habitability. Recommended prerequisites: G 201.

## G 351 - Introduction to Oceanography (4)

A survey course designed to give students a broad general background. Emphasis is on interrelationships of oceanography and other sciences. Us eful for general studies, teachers and en vironmental science majors.
Prerequisite: upper division standing.

## G 351U- Introduction to Oceanography (4)

A survey course designed to give students a broad general background. Emphasis is on interrelationships of oceanography and other sciences. Us eful for general studies, teachers and environmental science majors.
Prerequisite: upper-division standing.

## G 352U- Energy, Minerals, and the Environment (4)

We learn aboutenergy and mineral sources, global demand, and their impact on society and the environment. We study the science behind extraction, processing, and remediation of major minerals and sources of energy. Students explore costs and benefits of their own energy and mineralus age through a termproject. We als o discuss efforts to replace fossil fuels with renewables and the impact of resource consumption on global climate change.

## G 353 - Natural History of Dinosaurs (4)

Dinos aurs, their evolution, clas sification, ecology and extinction in the context of changing environments. Study of the geologic record and tools used by geologis ts to determine geologic ages and sequences. Mechanisms of global change ranging fromplate tectonics to asteroid impacts.

## G 355 -Earth and Space Sciences for Eementary Educators (4)

A survey of Earth and SpaceScience concepts for students interested in elementary education. Designed around "three-dimensionallearning" in the sciences:how to engage science content through science practice and recognition of science themes, as outlined in the Oregon Science Standards.

Prerequisite: upper division standing.

## G 374-Geomorphic Processes (4)

A study of landform processes at theearth's surface including the work of water, wind, and ice in erosion, trans portation, and deposition on land and sea. The significance of geomorphic processes to human activities is included. A one to two-day weekend field trip is required. Three lectures and one 3-hour laboratory. No credit allowed if taken after G 318. May not be used as an elective for the B.S. in geology. This course is the same as Geog 320; course may be taken only once for credit.

Prerequisite: G202 or equivalent. Corequisite: G374L. Cross-Listed as: Geog 320.

## G 374L - Lab for G 374 (0)

Lab for G 374.
Corequisite: G374.

## G 391L - Structural Geology Lab (0)

Lab for G 391.
Corequisite: G391.

## G 392L - Stratigraphy and Sedimentation Lab (0)

Lab for G 392.
Corequisite: G392.

## G 399 -Special Studies (0-6)

See department for course description. (Credit to be arranged.)

## G 401 - Research (1-6)

See department for course description. (Credit to be arranged.)
Prerequisite: G405.

## G 402 - Independent Study (1-12)

(Credit to be arranged.)

## G 403 - Thesis (1-4)

See department for course description.

Prerequisite: Successful completion of G401 (Research)
for 4 credits and Departmental approval. Graded A-F.

## G 404-Cooperative Education/Internship (1-12)

See department for course description. (Credit to be arranged.)

## G 405 - Reading and Conference (1-6)

See department for course description. (Credit to be arranged.)

## G 406 -Special Projects (1-9)

Credit to be arranged.

## G 407 -Seminar (1-6)

See department for course description. (Credit to be arranged.)

## G 410 - SelectedTopics (0-6)

See department for course description. (Credit to be arranged.) Consent of ins tructor.

## G 410L - Geophysics Lab (0-6)

Lab for Geophysics.

## G 420 - Applied Geophysics (4)

Principles of geophysical measurement and interpretation; seis mology, gravimetry, isostasy, geomagnetism, terres trial electricity. Includes a survey of geophysical exploration techniques. Three lectures, one 2-hour lab.
Also offered for graduate-level credit as G520 and may be taken only once for credit. . Prerequisite: one year of general physics, one year of calculus. Corequisite: G420L.
G 420L - Applied Geophysics Lab (0)
Lab for G 420.
Corequisite: G420.

## G 423 - Statistics andData Analysis in the Geosciences

 (4)Application of digital computers to problems in geology. Topics covered are analysis of data collected along a traverse, over a map area, and multivariate data. Applications to stratigraphic sections, chart recordings, sample locations, mapping, trend surfaces, and clustering. Two lectures and two 2-hour laboratory.

Also offered for graduate-level credit as G 523 and may be taken only once for credit. . Prerequisite: MTH 252.

G 423L - Lab for G 423 (0)
Lab for G 423.

## G 424-Geographical Information Systems for the Natural Sciences (4)

Spatial data are input, analyzed, and displayed. Techniques covered include: data management, projections and reference datum, digitizing, raster and vector operations, spatial statistics. Clas s projects apply data management and analysis techniques to the natural sciences. Weekly profes sional quality lab reports are required. GIS tutorial followed by a gateway examis used to demonstrate mastery of introductory material.

Also offered for graduate-level credit as G 524 and may be taken only once for credit. . Prerequisite: Upper division standing in a physical or life science or mathematics program. Corequisite: G424L.

## G 424L - Lab for G 424 (0)

Lab for G 424.
Corequisite: G424.

## G 425 - Field GIS (4)

Acquisition, storage, and dis play of field-based datafor the natural sciences. Geo spatial data generated using fieldbased technologies (i.e. GPS) are converted into appropriate databasestructures (i.e. GIS) for analy sis and reporting. Project design and implementation are developed in cooperation with the instructor. Integrated laboratory/field experience. Expected preparation: Stat 243 or G 324, 8 to 15 credits of lab based 200-level introductory courses in geology, biology, physics, chemistry, or environmental sciences.
Also offered for graduate-level credit as G 525 and may be taken only once for credit. . Prerequisite: Upper division standing.

## G 426 - Numerical Modeling of Earth Systems (4)

Application of modeling software to chemical, biological and physical global systems. Introduction to numerical methods, such as finite-elements and finite-differences, for solving systems of equations that describe geological processes. Two lectures and one 3-hour laboratory.
Prerequisite: G324. Corequisite: G426L.

## G 426L - Lab for G 426 (0)

Lab for G 426.
Corequisite: G426.

## G 430 - Life of the Past (4)

Origin and development of plants, animals and man on earth, as interpreted from the study of fos sils and the sedimentary rocks in which they occur. Includes integrated laboratory and field experience.
Prerequisite: upper division standing. Two lectures, one2hour laboratory (academic year) or field studies (summer).

## G 434-Structural Geology and Tectonics (5)

Study of origin, interpretation, and mapping of major and minor geologic structures and their relation to plate tectonics. Three lectures; two 2-hour laboratories; and required field study.
Prerequisite: ( Ph 201 and Ph 202 ) or ( Ph 211 and Ph 212 ), Mth 252, G 324. Corequisite: G434L.

## G 434L - Structural Geology Lab (0)

Lab for G 434.
Corequisite: G434.

## G 435-Sedimentology and Stratigraphy (5)

Description, interpretation, and correlation (stratigraphy) of sedimentary rocks used to reconstruct paleo environments, infer sea-levelchanges, and understand a basin's tectonic evolution. Two lectures, two 2-hour laboratories and required field study.

Prerequisite: G318 and G 314. Corequisite: G435L.

## G 435L - Lab for G 435 (0)

Lab for G 435 .
Corequisite: G435.

## G 436 - Sens ors and Instrumentation (4)

This course focuses on the construction and use of electronic instrumentation useful for Earth and Environmental Sciences. Expected preparation: Ph 202 or Ph 212. Some programming experience (e.g., G324/G 326, G 523).
Also offered for graduate-level credit as G 536 and may be taken only once for credit. Prerequisite: Ph 201/Ph 202 or Ph 211/Ph 212.

## G 437 - Analytical Methods (4)

Fundamentals, applications, and use of analytical methods in the analysis of earth materials. Analytical methods will include optical and X-ray methods and introduction to microthermometric analysis, differential thermal analysis, and granulometry. Two lectures; two 2-hour laboratory periods.

Prerequisite: G312, one year of general physics, radiation safety certification (acceptable as a corequisite).
Corequisite: G437L.

## G 437L - Analytical Methods Lab (0)

Lab for G 437.
Corequisite: G437.

## G 438 -Scanning Electron Microscopy in the Sciences

 (4)Theory and practice of scanning electron microscopy and elemental analys is, including beaminteractions, signal detection, image and spectrumformation, sample preparation, and data analysis. Student teams pursue original res earch projects using natural or manufactured specimens provided by science faculty. Graduate students are encouraged to explore thesis-related projects.
Also offered for graduate-level credit as G538 and may be taken only once for credit. . Prerequisite: introductory course sequence in geology, biology, chemistry, physics, environmental science or eng ineering. .

## G 439 - Powder X-ray Diffraction (2)

Identifies and quantifies minerals using powder X-ray diffraction (XRD), includes the nature and production of X-rays, basic X-ray crystallography, the principles and applications of X-ray diffraction, as well as certification for use of the X-ray diffractometer. Also includes an independent project to identify or quantify unknown minerals using the XRD.

Also offered for graduate-level credit as G 539 and may be taken only once for credit. . Prerequisite: G312 or one year of general chemistry.

## G 440 - Volcanology (4)

Classification of volcanic rocks and volcanic stratigraphic units; eruptive mechanisms; modes of volcanic deposition; recognition, mapping, and correlation of volcanic units; and stratigraphic syntheses of volcanic terranes. Two 75minute lectures, one 2-hour laboratory. Field trip is required.
Also offered for graduate-level credit as G 540 and may be taken only once for credit. . Prerequisite: G314. Corequisite: G440L.
G 440L - Volcanology Lab (0)
Lab for G 440.
Corequisite: G440.

## G 442 -Igneous Petrogenesis (4)

Investigation into the origin and evolution of magmas and igneous rock suites using geochemical and petrographic methods, differentiation of the Earth through time, global element cycles driven by igneous processes. Two lectures; two 2-hour laboratory periods.

Also offered for graduate-level credit as G 542 and may be taken only once for credit. . Prerequisite: G314.
Corequisite: G442L.

## G 442L - Igneous Petrogenesis Lab (0)

Lab for G 442.
Corequisite: G442.

## G 443 - Ground Water Geology (4)

Study of the physical and chemical properties of underground water; the physical properties of aquifers and their control and effect on the contained waters; water movement and the conservation and utilization of existing ground water bodies as well as development of new water bodies and rejuvenation of depleted and starved aquifers.

Also offered for graduate-level credit as G543 and may be taken only once for credit. . Prerequisite: (Ch 221 and Ch 222), (Ph 201 and Ph 202 ) or ( Ph 211 and Ph 212 ), Mth 252.

## G 444 - Well Dynamics (4)

Study of the interactions of water wells and an aquifer system, including all types of aquifer systems and pump tests to analyze those systems, well drilling and design, pump selection, and groundwater explorations.

Prerequisite: G443.

## G 445-Geochemistry (4)

A survey of geochemis try. Emphas is on distribution of elements in the Earth, nuclear geochemistry and thermodynamics of geologic systems.

Also offered for graduate-level credit as G 545 and may be taken only once for credit. . Prerequisite: G314.

## G 446 - Meteorites (4)

A course examining meteorites and the information they provide about the birth and evolution of the solar system. Topics include asteroids and asteroidal heat sources, the solar nebula, early solar s ystemchronology, pre-solar grains, abiotic synthesis of org anic matter, differentiation, impacts and collis ional processes, and meteorites from Mars. Three lectures.

Also offered for graduate-level credit as G546 and may be taken only once for credit. . Prerequisite: G201, Ch 221, Ch 222.

## G 447 -Environmental Sediment Transport (4)

Study of sediment transport, bedforms, and depositional environment, with focus on quantitative methods of predicting rates of sediment yield, tran sport, and deposition in terrestrial and marine environments.

Also offered for graduate-level credit as G 547 and may be taken only once for credit. . Prerequisite: ESR 220 or G 202 and Mth 251.

## G 448-Chemical Hydrogeology (4)

The study of low temperature aqueous groundwater geochemis try with emphasis on factors which change chemical composition of groundwater and factors which influence the transport of both inorganic and organic contaminants. Topics will include geochemistry of equilibriumreactions, mineral solubility, complexing, oxidation-reduction reactions, surface reactions and vadose zone processes. Two lectures, one2-hour laboratory.
Also offered for graduate-level credit as G 548 and may be taken only once for credit. . Prerequisite: Ch 221 and Ch 222. Corequisite: G448L.

G 448L - Lab for G 448 (0)
Lab for G 448.
Corequisite: G448.

## G 450 - Earth and Space Sciences for Middle/High School Educators (4)

Survey of Earth and SpaceScienceconcepts for students interested in middle and high school education. Course is designed around "three-dimensional learning": how to engage content through practices and recognition of themes, following Oregon Science Standards.
Also offered for graduate-level credit as G 550 and may be taken only once for credit. . Prerequisite: 24 credits of mathematics and/or sciencecourses.

## G 453 - Geology of the Pacific Northwest (4)

Survey of the topographic and geologic features of the Pacific Northwest, including mining history and focusing on the close relationship of the region as the leading edge of a moving continental plate.
Prerequisite: upper division standing. .

## G 454 - Cascade Volcanoes (1)

Field course in the study of one or more Cascade volcanoes-origin and development of volcano, eruptive mechanism, deposits, rocktypes, and hazards. Course may be repeated for different volcano studies. Offered summers. May be used to meet requirements for the B.A. in geology. May not be used to meet requirements for the B.S. in geology.

Also offered for graduate-level credit as G 554 and may be taken only once for credit. . Prerequisite: upper division standing and one prior course fromthe following: G201, G 202.

## G 455 -Environmental Coastal Geomorphology (4)

Introduction to coastal processes, geomorphology, habitat, and development issues: emphasis on coastal shelf, beach, estuarine and dune systems. Includes the influence of sealevel, tides, waves, wind, and development pressures on these coastal systems.

Also offered for graduate-level credit as G555 and may be taken only once for credit. . Prerequisite: G351U or G 318.

## G 456 - Astrogeology (4)

Geology and astronomy are combined to explore the evolution of the Universe and the Solar System. Comparative geologic evolution of the planets is emphasized. A significantcomponent of the course is hands-on geologic field investig ations and astronomical observations (summer) or 2-hour laboratory (academic year).
Also offered for graduate-level credit as G 556 and may be taken only once for credit. . Prerequisite: upper division standing. Corequisite: G456L.
G 456L - Lab for G 456 (0)
Lab for G 456.
Corequisite: G456.

## G 457 - Frontiers in Planetary Science (4)

Areas of active research in the planetary sciences on topics that have not yet made it into the Textbooks will be explored. Three main themes will be covered: 1) the formation of planetary systems, 2) the accretion and differentiation of planets, and3) the geologic and atmospheric evolution of planets. As appropriate for these themes, content will range widely, including aspects of as tronomy, geology, and climate.

Also offered for graduate-level credit as G557 and may be taken only once for credit. Prerequisite: Upper division standing, or by permission of instructor.

## G 458 - Astrobiology (4)

Astrobiology focuses on issues surrounding the origin and evolution of life on Earth, the environmental conditions required for life elsewhere, and the potential for life on other planets and satellites in our solar system. Additional topics include the discovery, occurrence, and habitability of extras olar planets, and the philosophical and societal implications of searching for life beyond earth.

Also offered for graduate-level credit as G558 and may be taken only once for credit. . Prerequisite: G322 or upper division standing in life, environmental, or physical science.

## G 459 - Quaternary Climate (4)

Study of the causes and consequences of climate change through the Quaternary. Topics include: an overview of climate systemdynamics; the geologic record of Quaternary climate and its profound glacial to interglacial cycles; the use of that record to develop conceptual models of paleoclimate interactions among land, ocean, atmosphere, and biosphere; and geologic changes during the Cenozoic (the last 65 million years) that setthe stage for the Quaternary. Includes computer laboratory exercises using paleoclimate data.

Also offered for graduate-level credit as G 559 and may be taken only once for credit. . Prerequisite: upper division standing in a physical or life science program. Corequisite: G 459L.

## G 459L - Quaternary Climate Lab (0)

Lab for 4459 .
Corequisite: G459.

## G 460 -Soil Geomorphology (4)

Effects of climate, vegetation, parent material, topography, and time on the development, weathering, classification, and chemistry of soils. Two 75-minute lectures and one 2hour laboratory.

Also offered for graduate-level credit as G 560 and may be taken only once for credit. . Prerequisite: G201, 202, Ch 200- level(1 year).

## G 460L - Soil Geomorphology Lab (0)

Lab for G 460.

## G 461 -Environmental Geology (4)

Study of naturalhazards and related land use planning (flooding, landslides, earthquakes, volcanic, coastal) waste dis posal and pollution in the geological environment, water supply, mineral and energy resources, environmental law related to geology, medical geology, climatic change. Two 75-minute lectures and one 2-hour laboratory.
Also offered for graduate-level credit as G 561 and may be taken only once for credit. . Prerequisite: general chemistry (1 year), G 201, 202. Corequisite: $G 461 \mathrm{~L}$.

## G 461L - Environmental Geology Lab (0)

Lab for G 461.
Corequisite: G461.

## G 462 -Hillslope Materials and Processes (4)

This class examines the physical, biological, and chemical processes that convert fresh bedrock into mobile regolith and transport materials on hillslopes. Topics include sediment budgets, hillslope hydrology, weathering, soil
production and transport, mass movements, landslides, and landscapeevolution.

Also offered for graduate-level credit as G562 and may only be taken once for credit. Prerequisite: (G318 or Geog 320 or ESM 320), and ( Ph 201 or Ph 211 orEAS 211) and Mth 251. Corequisite: G462L.

## G 462L - Lab for G 462 ()

Lab for G 462.
Corequisite: G462.

## G 464 - The Cryosphere (4)

Investigation of the global cryosphere-the regions on Earth's surface where water is found in its solid form-in order to develop a systems understanding of ice in the Earth system. Emphas is is placed on modern systems and climate change. Lecture and lab. Lab work uses modern observational dataand state-of-the-art climate simulation tools.

Prerequisite: upper-division or graduate standing.

## G 464L - The Cryosphere Lab (0)

Lab for the Cryosphere.

## G 465-Glacial Geomorphology (4)

The investigation of the importance of glaciers to landscape modification and global environmental change via an unders tanding of their formation, structure, mass and energy exchange, and movement. Erosion and deposition processes will also be examined. This class adopts the process perspective whereby understanding the physical processes provides significant insight into the relative importance of the controlling mechanisms of change. Field trip is required.

Also offered for graduate-level credit as G565 and may be taken only once for credit. . Prerequisite: introductory geology, physical geography, or geomorphology course.

## G 466 - Glaciology (4)

The physics of glacier ice and its mathematical description, and the processes that cause glaciers and ice sheets to change over time. Intended fors tudents with interests in glaciers, geophysical fluid flows, or who wish to build their quantitative and computational skills. Includes computational laboratory exercises.
Also offered for graduate-level credit as G566 and may be taken only once for credit. . Prerequisite: one year of calculus and one year of physics. Corequisite: G 466L.

## G 466L - Lab for G 466 (0)

Lab for G 466.
Corequisite: G466.

## G 470 -Engineering Geology (4)

Applications of geological information to en gineering problems:soil mechanics, rock mechanics, construction materials, groundwater and construction, instrumentation, exploration, terrain models, landslide analysis. Threehours of lecture and two hours of lab per week. Labs stress quantitative analysis. One day field trip explores landslides of the Portland area.
Also offered for graduate-level credit as G 570 and may be taken only once for credit. . Prerequisite: G202, Ph 203. Corequisite: G470L.
G 470L-Lab for G 470 (0)
Lab for 470.
Corequisite: G470.

## G 474L - Geomorphic Processes Lab (0)

Lab for G 474.
Corequisite: G474.

## G 475 - Introduction to Seismology and Site Evaluation

 (4)Earthquakes and exploration seismology, the origin and occurrence of earthquakes, nature and propag ation of seis mic waves in the earth, earthquakes as a hazard to life and property. Uses of reflection and refraction exploration seis mology, borehole velocity meas urements, seismic remote sensing, and direct meas urement techniques. Earthquake hazard as sessment including liquefaction, ground failure, and site amplification. Techniques for evaluating the susceptibility, potential, and severity of the hazards and other science and engineering applications. This course is the same as CE443 and may be taken only once forcredit.

Also offered for graduate-level credit as G 575 and may be taken only once for credit. Prerequisite: senior/ graduate standing. Cross-Listed as: CE 443.

## G 476 - Earthquake Geology (4)

Characterizes earthquakes froma geological perspective. Course content includes discussion of the earthquake process, and the application of a variety of tools (e.g. geomorphology, stratigraphy, structure, geophysics, and seis mology) to evaluate the earthquake cycle. The course will coversub-disciplines within earthquake geology and skills necessary to conduct a geological investigation of earthquakes. The class will evaluate the four tectonic environments; transform, extensional, subduction, and continental collis ion. Field trips required.

Also offered for graduate level credit as G576 and may be taken only once for credit. Prerequisite: G318. Corequisite: G476L.

## G 476L - Lab for G 476 (0)

Lab for G 476.

## G 477 - Farthquake Accommodation and Design (4)

Effects of earthquake shaking in the design of buildings, pipelines, bridges, and dams. Incorporating the earthquake hazard assessment for a project in the design process. The goal of this course is to allow geologists, geotechnical engineers, structural engineers, and architects to see how their particular tasks are impacted by the earthquake effects. Types of analysis used to evaluate earthquake design requirements in the several disciplines including geology, geotechnical engineering, structural engineering, and architecture. This course is the same as CE448 and may be taken only once for credit.

Also offered for graduate-level credit as G577 and may be taken only once for credit. Prerequisite: G475/575 or CE 443/543.

## G 480 - Basin Analysis (4)

An integrated look at sedimentary basins and their formation. Sedimentary basins contain valuable res ources (water, geothermal, fossil fuels) and record tectonic processes. Bas in geometries will be described through hands-on exercises using well log, potential fields, and seis mic data. These will be used to constrain mountain building, paleoclimate, and mantle processes.
Also offered for graduate-level credit as G580 and may be taken only once for credit. Prerequisite: G 435 .

## G 481 - Field Geology (4)

Geologic mapping in sedimentary and volcanic rocks or metamorphic and plutonic rocks during a summer field camp. A charge will be made for the expenses of the field camp. Approximately 64 hours of field work in the summer.
Also offered for graduate-level credit as G581 and may be taken only once for credit. . Prerequisite: G485.

## G 484 - Field Geophysics (4)

Applications of geophysical techniques to solving a field problem. Methods applied may include gravity, resistivity, refraction ground penetrating radar, and magnetics. Includes at least one weekend in the field and production of a final report with data and conclusions.
Also offered for graduate-level credit as G584 and may be taken only once for credit. . Prerequisite: Ph 203 or Ph 213 , Mth 261.

## G 485-Geologic Mapping (4)

Principles of geologic mapping, and data collection using optical surveying instruments, GlobalPositioning System, and aerial photographs, preparation of reports and maps.

Two lectures and one4-hour laboratory. One-week field exercise at end of term.

Prerequisite: G434 and G 435. Corequis ite: G485L.

## G 485L - Lab for G 485 (0)

Lab for G 485.
Corequisite: G485.

## G 491 -Physical Processes in Geology (4)

Application of mechanics to physical processes in geology, such as igneous intrusion, rock folding, debris flow, lava flow, groundwater, and glaciation.

Also offered for graduate-level credit as G 591 and may be taken only once for credit. . Prerequisite: Mth 254, Ph 203.

## G 492 - Topics in Geodynamics (4)

Special topics concerning the dynamics that govern earth processes such as fluid flows and plate motions, and related physical properties of Earth materials.
Representative topics include ice sheet dynamics, glacier dynamics, and thermodynamic modes of earth systems. May be repeated for credit if topics are different. Two lectures andone2-hour laboratory.
Prerequisite: Mth $254, \mathrm{Ph} 213$, and G426.

## G 499 -Special Studies (0-8)

(Credit to be arranged.)

## G 501 - Research (1-9)

(Credit to be arranged.)
Prerequisite: G405.

## G 502 - Independent Study (1-6)

See department for course description. (Credit to be arranged.) Pass/no pass only.

## G 503 -Thesis (1-12)

See department for course description. (Credit to be arranged.) Pass/no pass only.

## G 504-Cooperative Education/Internship (1-9)

See department for course description. (Credit to be arranged.)

## G 505 - Reading and Conference (1-6)

See department for course description. (Credit to be arranged.)

## G 506-Special Problems (1-6)

See department for course description. (Credit to be arranged.)

## G 507-Seminar (1-6)

See department for course description. (Credit to be arranged.)

## G 510 - SelectedTopics (0-6)

See department for course description. (Credit to be arranged.) Consent of ins tructor.

## G 510L - Geophysics Lab (0-6)

Lab for Geophysics.

## G 518 - Clay Mineralogy (4)

Contact the department for a description of this class.

## G 520 - Applied Geophysics (4)

Principles of geophysical measurement and interpretation; seis mology, gravimetry, is ostasy, geomagnetism, terrestrial electricity. Includes a survey of geophysical exploration techniques. Three lectures, one 2-hour lab.
Also offered for undergraduate-level credit as G420 and may be taken only once for credit. . Corequisite: G 520L.

## G 520L - Applied Geophysics Lab (0)

Lab for G 520.
Corequisite: G520.

## G 523 - Statistics andData Analysis in the Geosciences

 (4)Application of digital computers to problems in geology. Topics covered are analysis of data collected along a traverse, over a map area, and multivariate data. Applications to stratigraphic sections, chart recordings, sample locations, mapping, trend surfaces, and clustering. Two lectures and two 2-hour laboratory.
Also offered for undergraduate-level credit as G423 and may be taken only once for credit. .

G 523L - Lab for G 523 (0)
Lab for G 523.

## G 524-Geographical Information Systems for the Natural Sciences (4)

Spatial data are input, analyzed, and dis played. Techniques covered include: data management, projections and reference datum, digitizing, raster and vector operations, spatial statistics. Clas s projects apply data management and analysis techniques to the natural sciences. Weekly profes sional quality lab reports are required. GIS tutorial followed by a gateway examis used to demonstrate mastery of introductory material.
Also offered for undergraduate-levelcredit as G424 and may be taken only once for credit. . Corequisite: G 524L.
G 524L - Lab for G 524 (0)
Lab for G 524 .
Corequisite: G524.

## G 525 - Field GIS (4)

Acquisition, storage, and dis play of field-based datafor the natural sciences. Geos patial data generated using fieldbased technologies (i.e. GPS) are converted into appropriate databasestructures (i.e. GIS) for analysis and reporting. Project design and implementation are developed in cooperation with the instructor. Integrated laboratory/ field experience.

Also offered for undergraduate-levelcredit as G425 and may be taken only once for credit. .

## G 536 -Sensors and Instrumentation (4)

This course focuses on the construction and use of electronic ins trumentation useful for Earth and Environmental Sciences. Expected preparation: Ph 202 or Ph 212. Some programming experience (e.g., G324/G 326, G 523).

Also offered for undergraduate-levelcredit as G436 and may be taken only once for credit.

## G 537 - Analytical Methods (4)

Fundamentals, applications, and use of analytical methods in the analysis of earth materials. Analytical methods will include optical and X-ray methods and introduction to microthermometric analy sis, differential thermal analy sis, and granulometry. Two lectures; two 2-hour laboratory periods.

Prerequisite: G312, one year of general physics, radiation safety certification (acceptable as a corequisite). Corequisite: G537L.

## G 537L - Analytical Methods Lab (0)

Lab for G 537.
Corequisite: G537.

G 538 -Scanning Electron Microscopy in the Sciences (4)

Theory and practice of scanning electron microscopy and elemental analysis, including beaminteractions, signal detection, image and spectrumformation, sample preparation, and dataanalysis. Student teams pursue original research projects using natural or manufactured specimens provided by science faculty. Graduate students are encouraged to explore thesis-related projects.
Also offered for undergraduate-level credit as G438 and may be taken only once for credit. . Prerequis ite: introductory course sequence in geology, biology, chemistry, physics, environmental science or engineering.

## G 539 - Powder X-ray Diffraction (2)

Identifies and quantifies minerals using powder X-ray diffraction (XRD), includes the nature and production of X-rays, basic X-ray crystallography, the principles and applications of X-ray diffraction, as well as certification for use of the X-ray diffractometer. Also includes an independent project to identify or quantify unknown minerals using the XRD.
Also offered for undergraduate-level credit as G439 and may be taken only once for credit. .

## G 540 - Volcanology (4)

Classification of volcanic rocks and volcanic stratigraphic units; eruptive mechanisms; modes of volcanic deposition; recognition, mapping, and correlation of volcanic units; and stratigraphic syntheses of volcanic terranes. Two 75minute lectures, one 2-hour laboratory. Field trip is required.
Also offered for undergraduate-level credit as G440 and may be taken only once for credit. . Corequisite: G540L.

G 540L - Volcanology Lab (0)
Lab for G 540.
Corequisite: G540.

## G 542 - Igneous Petrogenesis (4)

Inves tigation into the origin and evolution of magmas and igneous rock suites using geochemical and petrographic methods, differentiation of the Earth through time, global element cycles driven by igneous processes. Two lectures; two 2-hour laboratory periods.
Also offered for undergraduate-level credit as G442 and may be taken only once for credit. . Corequisite: G 542L.

## G 542L - Igneous Petrogenesis Lab (0)

Lab for G 542.
Corequisite: G542.

## G 543 - Ground Water Geology (4)

Study of the physical and chemical properties of underground water; the physical properties of aquifers and their control and effect on the contained waters; water movement and the conservation and utilization of existing ground water bodies as well as development of new water bodies and rejuvenation of depleted and starved aquifers.

Also offered for undergraduate-levelcredit as G443 and may be taken only once for credit. .

## G 544 - Well Dynamics (4)

Study of the interactions of water wells and an aquifer system, including all types of aquifer systems and pump tests to analyze those systems, well drilling and design, pump selection, and groundwater explorations.

Prerequisite: G443.

## G 545-Geochemistry (4)

A survey of geochemis try. Emphasis on dis tribution of elements in the Earth, nuclear geochemistry and thermodynamics of geologic systems.

Also offered for undergraduate-levelcredit as G445 and may be taken only once for credit. .

## G 546-Meteorites (4)

A course examining meteorites and the information they provide about the birth and evolution of the solar system. Topics include asteroids and asteroidal heat sources, the solar nebula, early solar sy stemchronology, pre-solar grains, abiotic synthesis of org anic matter, differentiation, impacts and collis ional processes, and meteorites from Mars. Three lectures.

Also offered for undergraduate-levelcredit as G446 and may be taken only once for credit. .

## G 547-Environmental Sediment Transport (4)

Study of sediment transport, bedforms, and depositional en vironment, with focus on quantitative methods of predicting rates of sediment yield, transport, and deposition in terrestrial and marine environments.

Also offered for undergraduate-levelcredit as G447 and may be taken only once for credit. .

## G 548 - Chemical Hydrogeology (4)

The study of low temperature aqueous groundwater geochemistry with emphasis on factors which change chemical composition of groundwater and factors which influence the transport of both inorganic and org anic contaminants. Topics will include geochemistry of equilibriumreactions, mineral solubility, complexing, oxidation-reduction reactions, surface reactions and vadose zone processes. Two lectures, one 2-hour laboratory.

Also offered for undergraduate-level credit as G448 and may be taken only once for credit. . Corequisite: G 548L.

## G 548L - Lab for G 548 (0)

Lab for G 548.
Corequisite: G548.

## G 550 - Earth and Space Sciences for Middle/High School Educators (4)

Survey of Earth and Space Scienceconcepts for students interested in middle and high school education. Course is designed around "three-dimensional learning": how to engage content through practices and recognition of themes, following Oregon Science Standards.
Also offered for undergraduate-level credit as G450 and may be taken only once for credit. .

## G 554 - Cas cade Volcanoes (1)

Field course in the study of one or more Cascade volcanoes-origin and development of volcano, eruptive mechanis $m$, deposits, rocktypes, and hazards. Course may be repeated for different volcano studies. Offered summers. May be used to meet requirements for the B.A. in geology. May not be used to meet requirements for the B.S. in geology.

Also offered for undergraduate-level credit as G454 and may be taken only once for credit. .
G 555 - Environmental Coastal Geomorphology (4)
Introduction to coastal processes, geomorphology, habitat, and development issues: emphasis on coastal shelf, beach, estuarine and dune systems. Includes the influence of sealevel, tides, waves, wind, and development pressures on these coastal systems.

Also offered for undergraduate-level credit as G455 and may be taken only once for credit. .

## G 556 - Astrogeology (4)

Geology and astronomy are combined to explore the evolution of the Universe and the Solar System. Comparative geologic evolution of the planets is emphasized. A significantcomponent of the course is hands-on geologic field investigations and astronomical observations (summer) or 2-hour laboratory (academic year).

Also offered for undergraduate-level credit as G456 and may be taken only once for credit. . Corequisite: G 556L.
G 556L - Lab for G 556 (0)
Lab for G 556.
Corequisite: G556.

## G 557 -Frontiers in Planetary Science (4)

Areas of active research in the planetary sciences on topics that have not yet made it into the Textbooks will be explored. Three main themes will be covered: 1) the formation of planetary systems, 2) the accretion and differentiation of planets, and 3) the geologic and atmospheric evolution of planets. As appropriate for these themes, content will range widely, including aspects of as tronomy, geology, and climate.
Also offered for undergraduate-levelcredit as G457 and may be taken only once for credit.

## G 558 - Astrobiology (4)

Astrobiology focuses on issues surrounding theorigin and evolution of life on Earth, the environmental conditions required for life elsewhere, and the potential for life on other planets and satellites in our solar s ystem. Additional topics include the dis covery, occurrence, and habitability of extras olar planets, and the philosophical and societal implications of searching for life beyond earth.
Also offered for undergraduate-levelcredit as G458 and may be taken only once for credit. .

## G 559 - Quaternary Climate (4)

Study of the causes and consequences of climate change through the Quaternary. Topics include: an overview of climate systemdynamics; the geologic record of Quaternary climate and its profound glacial to interg lacial cycles; the use of that record to develop conceptual models of paleoclimate interactions among land, ocean, atmosphere, and biosphere; and geologic changes during the Cenozoic (the last 65 million years) that setthe stage for the Quaternary. Includes computer laboratory exercises using paleoclimate data.
Also offered for undergraduate-levelcredit as G459 and may be taken only once for credit. . Corequisite: G 559L.

## G 559L - Quaternary Climate Lab (0)

Lab for G 559.
Corequisite: G559.

## G 560 -Soil Geomorphology (4)

Effects of climate, vegetation, parent material, topography, and time on the development, weathering, classification, and chemistry of soils. Two 75-minute lectures and one2hour laboratory.
Also offered for undergraduate-levelcredit as G460 and may be taken only once for credit. .
G 560L - Soil Geomorphology Lab (0)
Lab for G 560.

## G 561 - Environmental Geology (4)

Study of natural hazards and related land use planning (flooding, landslides, earthquakes, volcanic, coastal) waste disposal and pollution in the geological environment, water supply, mineral and energy res ources, environmental law related to geology, medical geology, climatic change. Two 75-minute lectures and one 2-hour laboratory.
Also offered for undergraduate-level credit as G461 and may be taken only once for credit. . Corequisite: G 561 L .

## G 561L - Environmental Geology Lab (0)

Lab for G 561.
Corequisite: G561.

## G 562 - Hillslope Materials and Processes (4)

This class examines the physical, biological, and chemical processes that convert fresh bedrock into mobile regolith and transport materials on hills lopes. Topics include sediment budgets, hills lope hydrology, weathering, soil production and transport, mass movements, landslides, and landscape evolution.

Also offered for undergraduate-level credit as G462 and may only be taken once for credit. Corequisite: G 562L.

## G 562L - Lab for G 562 ()

Lab for G 562.
Corequisite: G562.

## G 564 - The Cryosphere (4)

Investigation of the global cryosphere-the regions on Earth's surface where water is found in its solid form-in order to develop a systems understanding of ice in the Earth system. Emphas is is placed on modern systems and climate change. Lecture and lab. Lab work uses modern observational dataand state-of-the-art climate simulation tools.
Prerequisite: upper-division or graduate standing.
G 564L - The Cryosphere Lab (0)
Lab for the Cryosphere.

## G 565-Glacial Geomorphology (4)

The investigation of the importance of glaciers to landscape modification and global environmental change via an unders tanding of their formation, structure, mass and energy exchange, and movement. Erosion and deposition processes will also be examined. This class adopts the process perspective whereby understanding the physical processes provides significant insight into the relative importance of the controlling mechanisms of change. Field trip is required.

Also offered for undergraduate-levelcredit as G465 and may be taken only once for credit. .

## G 566 - Glaciology (4)

The physics of glacier ice and its mathematical description, and the processes that cause glaciers and ice sheets to change over time. Intended for students with interests in glaciers, geophysical fluid flows, or who wish to build their quantitative and computational skills. Includes computational laboratory exercises.

Also offered for undergraduate-level credit as G466 and may be taken only once for credit. . Corequis ite: G 566L.

## G 566L - Lab for G 566 (0)

Lab for G 566.
Corequisite: G566.

## G 570 - Engineering Geology (4)

Applications of geological information to engineering problems: soil mechanics, rock mechanics, construction materials, groundwater and construction, instrumentation, exploration, terrain models, landslide analysis. Threehours of lecture and two hours of lab per week. Labs stress quantitative analysis. One day field trip explores landslides of the Portland area.
Also offered for undergraduate-levelcredit as G470 and may be taken only once for credit. . Corequis ite: G570L.
G 570L - Lab for G 570 (0)
Lab for G 570.
Corequisite: G570.

## G 571 - Advanced Engineering Geology (4)

Strength and stability of earth materials, resources, and land use, exploration and instrumentation, professional practices.

Also offered for credit as 671 and may be taken only once for credit. .

## G 571L - Lab for G 571 (0)

Lab for G 571.

## G 574L - Geomorphic Processes Lab (0)

Lab for G 574.
Corequisite: G574.

## G 575 - Introduction to Seismology and Site Evaluation

 (4)Earthquakes and exploration seismology, the origin and occurrence of earthquakes, nature and propagation of seis mic waves in the earth, earthquakes as a hazard to life and property. Uses of reflection and refraction exploration
seis mology, borehole velocity meas urements, seismic remote sensing, and direct measurement techniques. Earthquake hazard as sessment including liquefaction, ground failure, and site amplification. Techniques for evaluating the susceptibility, potential, and severity of the hazards and other science and engineering applications. This course is the same as CE543 and may be taken only once for credit.
Also offered for undergraduate-level credit as G475 and may be taken only once for credit. Prerequisite: senior/ graduate standing. Cross-Listed as: CE 543.

## G 576 - Earthquake Geology (4)

Characterizes earthquakes froma geological perspective. Course content includes discussion of the earthquake process, and the application of a variety of tools (e.g. geomorphology, stratigraphy, structure, geophysics, and seis mology) to evaluate the earthquake cycle. The course will coversub-disciplines within earthquake geology and skills necessary to conduct a geological investigation of earthquakes. The class will evaluate the four tectonic environments; transform, extensional, subduction, and continental collis ion. Field trips required.

Also offered for undergraduate level credit as G476 and may be taken only once for credit. Prerequisite: Graduate standing. Corequis ite: G 576L.
G 576L-Lab for G 576 (0)
Lab for G 576.

## G 577 - Earthquake Accommodation and Design (4)

Effects of earthquake shaking in the design of buildings, pipelines, bridges, and dams. Incorporating the earthquake hazard as sessment for a project in the design process. The goal of this course is to allow geologists, geotechnical engineers, structural engineers, and architects to see how their particular tasks are impacted by the earthquake effects. Types of analysis used to evaluate earthquake design requirements in the several disciplines including geology, geotechnical engineering, structural engineering, and architecture. This is the same course as CE548 and may be taken only once for credit.

Also offered for undergraduate-level credit as G477 and may be taken only once for credit. Prerequisite: G475/G 575 or CE 443/CE 543.

## G 580 - Basin Analysis (4)

An integrated look at sedimentary basins and their formation. Sedimentary basins contain valuable res ources (water, geothermal, fossil fuels) and record tectonic processes. Bas in geometries will be described through hands-on exercises using well log, potential fields, and seis mic data. These will be used to constrain mountain building, paleoclimate, and mantle processes.

Also offered for undergraduate-levelcredit as G480 and may be taken only once for credit.

## G 581 -Field Geology (4)

Geologic mapping in sedimentary and volcanic rocks or metamorphic and plutonic rocks during a summer field camp. A charge will be made for the expenses of the field camp. Approximately 64 hours of field work in the summer.

Also offered for undergraduate-levelcredit as G481 and may be taken only once for credit. . Prerequisite: G485.

## G 584 -Field Geophysics (4)

Applications of geophysical techniques to solving a field problem. Methods applied may includegravity, resistivity, refraction ground penetrating radar, and magnetics. Includes at least one weekend in the field and production of a final report with data and conclusions.
Also offered for undergraduate-levelcredit as G484 and may be taken only once for credit. .

## G 591 -Physical Processes in Geology (4)

Application of mechanics to physical processes in geology, such as igneous intrusion, rock folding, debris flow, lava flow, groundwater, and glaciation.
Also offered for undergraduate-levelcredit as G491 and may be taken only once for credit. .

## G 592 - Methods in Quaternary Stratigraphy (4)

Analysis of the methods used and their applications in physical stratigraphy including seismic, sequence, geochemical, paleomagnetic, well log, and topics in Quaternary process stratigraphy.
Also offered for credit as G692 and may be taken only once for credit. . Prerequisite: G434.

G 595 - Topics in Geomechanics (4)
Topics chosen fromfinite strain, rock fracture, and rock folding. May be repeated if topics are different.
Also offered for credit as G695. . Prerequisite: G491/591, Mth 254, Ph 203.

## G 601 - Research (1-12)

See department for course description. (Credit to be arranged.)

## G 602 -Independent Study (1-6)

See department for course description. (Credit to be arranged.) Pass/no pass only.

## G 603 - Dissertation (1-12)

See department for course description. (Credit to be arranged.)

## G 604 - Cooperative Education/Internship (1-9)

See department for course description. (Credit to be arranged.)

## G 605 - Reading and Conference (1-9)

See department for course description. (Credit to be arranged.)

## G 606 -Special Problems/Projects (1-9)

See department for course description. (Credit to be arranged.)

## G 607 -Seminar (1-9)

See department for course description. (Credit to be arranged.)

## G 609 - Practicum(1-9)

(Credit to be arranged.)

## G 610 -SelectedTopics (1-9)

See department for course description. (Credit to be arranged.)

## G 610L-Special Topics Lab (0)

Lab for G 610.

## G 612 - Topics in Igneous Petrology (4)

Topics in the origin and formation of igneous rock masses; their derivation, evolution, chemistry, structure, and modes of emplacement. Advanced techniques in analysis and examination. May be repeated if topics are different. Two lectures and one2-hour laboratory.
Prerequisite: G542.

## G 618 - Clay Mineralogy (4)

Clay structure and classification, clay mineral analyses including X-ray identification and differential thermal analys is, mixed-layer clays, clay-water systems, clay mineral-org anic reactions, engineering properties related to
clay materials, geological occurrence of clays. Major emphasis on engineering problems related to clays and the field occurrence of clays.

Prerequisite: radiation safety certification.

## G 619 - Topics in Geochemistry (4)

Topics in the application of geochemistry to solve geological problems. Advanced techniques in analysis and examination. Two lectures and one2-hour laboratory. May be repeated if topics are different.
Prerequisite: G545.

## G 650 - Research Methods I - Reading (4)

The goal of this course is to build your research skills around obtaining, using, and communicating scientific information. This course will help you to usescientific literature, understand the development of scientific argument, and communicate research ideas through writing and presentation.
Prerequisite: Graduate standing.

## G 651 - Research Methods II - Writing (4)

Scientific writing involves understanding the components of a well-written product as well as the strategies for planning and maintaining good writing practice. The explicit goal of this course is to make significant progress on your writing. To meet explicit writing goal relevant to your course of study, students will work to develop and reflect on pers onal writing strategies, review the components of effective scientific writing, and create and evaluate scientific writing relative to best practices.
Prerequisite: Graduate standing.

## G 671 - Advanced Engineering Geology (4)

Strength and stability of earth materials, resources, and land use, exploration and instrumentation, professional practices.
Also offered for credit as 571 and may be taken only once for credit. . Prerequisite: G470.

## G 692 - Methods in Quaternary Stratigraphy (4)

Analysis of the methods used and their applications in physical stratigraphy including seismic, sequence, geochemical, paleomagnetic, well log, and topics in Quaternary process stratigraphy.
Also offered for credit as G592 and may be taken only once forcredit. . Prerequisite: G434.

## G 695 - Topics in Geomechanics (4)

Topics chosen fromfinite strain, rock fracture, and rock folding. May be repeated if topics are different.
Also offered for credit as G595. . Prerequisite: G491/591, Mth 254, Ph 203.

Geog - Geography

## Geog 199 -Special Studies (1-6)

See department for course description. (Credit to be arranged.)

## Geog 210 - Physical Geography (4)

An introduction to the physical elements of geography and the environment in which people live. The focus is on natural processes that create physical diversity on theearth. Major topics are weather and climate, vegetation and soils, landforms, ecosystems, their distribution and signific ance.
Corequisite: Geog 210L.
Geog 210L - Lab for Geog 210 (0)
Lab for Geog 210.
Corequisite: Geog 210.

## Geog 230 - Environment and Society: Global Perspectives (4)

An introduction to the ways in which humans, acting through social constraints and structures, have lived in and modified their environment. The spatial patterns produced from human activities (such as population growth, trans portation systems, urban structure, economic development, resource use and management, and the evolution of political patterns) are considered in a global context. Case studies fromseveral world regions illustrate the processes by which humans modify their world to create distinctive culturallandscapes.

## Geog 299 - Special Studies (1-4)

(Credit to be arranged.)

## Geog 310U-Climate and Water Resources (4)

An inquiry-based examination of the principal controls on climate and hydrology, with emphasis on processes and interactions; students will do fieldwork, data analysis, and laboratory work. Recommended prerequisite: Natural Science Inquiry. Also listed as Sci 333; course may be taken only once for credit.

Cross-Listed as: Sci 333U.

## Geog 311U- Climatology (4)

A study of the physical processes which comprise the climatic system, from the global scale to the local scale. Particular attention is given to the nature of climatic variability, its causes, and its implications for human activity. Recommended prerequisite: Geog 210.

## Geog 312U- Climate Variability and Change (4)

Provides an understanding of how and why climate varies and changes over space and time. Climate variability is explored across a range of scales fromice ages to monsoon circulations. Examines the scientific basis for anthropogenic climate change and how it differs from natural climate variability. Students will learn by analyzing climate data, performing experiments with climate models, and researching how climate variability and change impact every day life. Includes laboratory and/or fieldwork.

Cross-Listed as: Also offered as Sci 334 U and may be taken only once for credit.
Geog 313U- Biogeography (4)
This course examines current and his torical distributions of org anis ms as explained by environmental and biological factors. The goal of the course is to improve student understanding of how multiple factors such as soil properties, natural selection, climate change, and human activities shape the geography of org anisms at local to global scales. Recommended prerequisite: Geog 210.

## Geog 314U-Severe Weather (4)

Examination of severe and hazardous weather processes such as hurricanes, tornadoes, and thunderstorms. Evaluation of the human-environment interaction of severe weather and the potential consequences of global climate change on the intensity and location of severe weather phenomena. Recommended prerequisite: Geog 210.

## Geog 320 - Geomorphic Processes (4)

Study of landform processes at the earth's surface including the work of water, wind, and ice in erosion, trans portation, and deposition on land and sea. The significance of geomorphic processes to human activities is included. A one-to two-day weekend field trip is required. Three lectures; one 3-hour lab. This course is the same as G 374; course may be taken only once for credit. Expected preparation: Geog 210 and Mth 111.

Corequisite: Geog 320L. Cross-Listed as: G 374.
Geog 320L-Geomorphic Processes Lab (0)
Lab for Geog 320.
Corequisite: Geog 320.

## Geog 321 -Mt. Hood (4)

Examines the physical and cultural systems that shapeMt. Hood and investigates some of the is sues that arise when a mostly wild mountain abuts an urban area. Class in volves lecture, discussion, research, and field trips.

## Geog 322U- Alpine Environments (4)

Examines the geoecology of high elevation environments in tropical, mid-latitude, and high altitude regions with a specialemphasis on the alpine environment of the Pacific Northwest. The primary objective is to promote understanding of the features and processes found in alpine areas including their susceptibility to human alteration. Topics include an examination of high elevation weather and climate, geomorphology, soils, and vegetation.
Recommended prerequisite: Geog 210.

## Geog 331U- Geography of Globalization (4)

An introduction to theories and concepts related to global economic activities within agriculture, manufacturing, service and information industries. The course focuses on global processes and linkages between local and global economies. Includes geographic distributions, areal interaction among urban and regional economies, the processes of regional economic development, and international economic linkages. Recommended prerequisite: upper-division standing.

## Geog 332U- Urban Geography (4)

Introduction to the geographical factors affecting the development of the modern city. Topics include urban systems and the location of cities; residential, commercial, and industrial structure; social and physical characteristics of cities; the built environment; the urban economy; and planning the urban environment. Recommended prerequisite: upper division standing.

## Geog 333U- Weather (4)

Introductory course in the atmospheric environment providing a comprehensive understanding of atmospheric structure and the changes over time that result in the weather we experience. Topics include, atmospheric moisture (fog, rain, clouds), atmospheric stability and cloud development, air pressure and winds, air masses and fronts, and hurricanes and tornados. This course is the same as Ph 333; course may be taken only once for credit. Recommended: upper division standing or Geog 210.
Cross-Listed as: Ph 333U.

## Geog 340U- Global Water Issues and Sustainability (4)

Examines the availability and quality of freshwater resources around the world. Includes the global water cycle, human use and modifications of global water systems, effects of climate changeon global freshwater, water policy in international rivers, and sustainable water
resource management. Focuses on case studies in major international rivers.

## Geog 345U- Resource Management (4)

Survey of natural res ources, their occurrence, and their management. Primary focus will be on the United States, with case studies fromother countries and regions. Recommended prerequisite: upper division standing.

## Geog 346U- World Population and Food Supply (4)

An introduction to the dynamics of the current national and international problems associated with rapid population growth, unemployment, major population migrations, shortages of food and other critical commodities, and the presentand potential adjustments to these situations. Recommended prerequisite: upper division standing.

## Geog 347U Environmental Issues andAction (4)

Examines environmentalismas a phenomenon reflecting cultural appraisals of nature and society's relat ionship to it. Explores the his tory and ideology of the environmental movement, and investig ates the contemporary structure, concerns, effects, critiques, and directions of environmentalism. Recommended prerequisite: upper division standing.

## Geog 348U- Cultural and Political Ecology (4)

Introduction to geographic perspectives on cultural and political ecology. Investigates cultural adaptation and environmental change froman ecological pers pective, focusing on biomes, cultural adaptations within themand the politicals structures that influence cultural adaptations. Particular attention to traditional societies and the impacts of development. Recommended prerequisite: upperdivision standing.

## Geog 349U- Mountain Geography (4)

Investigates mountain en vironments as distinctive biophysical and culturalrealms. Surveys the human occupation and use of mountainous areas of Eurasia, Africa, the Pacific, and the Americas, and explores highland-lowland interactions in selected cases. Topics include cultural adaptation, mountain resource management and policy, and developments and its impacts in highland environments.

## Geog 350U- Geography of World Affairs (4)

Examines the major world trouble spots in light of longstanding political-geographical rivalries, including ethnic group rivalries, economic dis parities, and conflicting historical claims. Particularemphasis will be placed on political organization of territory, nationalis $m$, boundary conflicts, colonialis m, and, where relevant, metropolitan political fragmentation. Recommended prerequisite: upper division standing.

## Geog 351U - Pacific Northwest (4)

Study of the Pacific Northwest as a region of the United States. Overview of the region and its relationship to other parts of the world will be followed by an analysis of the physicalenvironment, natural res ources, agriculture, manufacturing, transportation, population, and urban development. Special attention will be paid to theoretical developments in contemporary regional geography issues. Recommended prerequisite: upper division standing.

## Geog 352U- The Himalaya and Tibet (4)

Survey of the physical and cultural landscapes of the Himalaya-Hindukush and the Tibetan Plateau. It investigates not only the places and peoples within it but also ideas about it and their influence on its history and presentsituation.

## Geog 353U- Pacific Rim(4)

Provides a comprehensive look at the events and people shaping the last 150 years of Asia-Pacific his tory and relates themto Pacific Bas in relationships today. Reveals how, from the 19th century onward, modern nations have emerged from the rich and varied cultures and society of Pacific Asia. Particular emphasis is placed on political and economic geography of East Asia in relation to contemporary American and Japanese interests in the region. Recommended prerequisite: upper division standing.

## Geog 354U - Europe (4)

Focuses on thechanging economic and political geography of Europe, post World War II, and the adjustments to changing world conditions. Analysis of the geographic conditions of individual countries. Examines their population, urban and rural settlements, physical geography, agriculture, and industry. Recommended prerequisite: upper division standing.

## Geog 360U- Latin America (4)

Analysis of changing landscapes and lifeways in Latin America. The focus is on physical, cultural, and economic forces that have interacted to create a distinctive world region. Particular attention is given to the impact of large scale is sues such as global climate change, trade, the environment, and the debt crisis on the lands and lives of everyday people in the region. Recommended prerequisite: upper division standing.

## Geog 363U- Geography of sub-Saharan Africa (4)

A survey course on the physical and human geography of the continent of Africa, focusing on the variability of the physical landscape, including geomorphology, vegetation, and climate and on the patterns and implications of cultural diversity. Examines links between natural resources, economic development, and environmental management on location, national and regional scales. Case studies from various countries and regions will be used.

## Geog 364U- The Middle East (4)

A survey of the physical and cultural landscapes of southwestern Asia and North Africa, emphasizing the interaction of environmental factors and dynamic economic and political forces in the region as a whole. Problems common to the nations of the region are examined, including the difficulties of political cohesion, urbanization, and ecological impacts of tradition and contemporary land-use practices. Recommended prerequisite: upperdivision standing.

## Geog 366U- Historical Geography of North America (4)

Survey of the evolving geography of North America during the last four centuries; the formation and growth of regions fromthe initial period of European exploration and colonization to the present. Topic include the acquisition of geographical knowledge; cultural transfer and acculturation; westward expansion; resource exploitation; regional and national integ ration; and landscape change. Recommended prerequisite: upper division standing.

## Geog 368U- United States and Canada (4)

Survey of the contemporary regional geography of the United States and Canada including physical environments, cultural landscapes, andeconomic activities. Topics will include the development of distinctiveregions; the changing spatial relationships between the location of resources and population; urban/rural dis parities; and
national and regional roles in the global economy. Recommended prerequisite: upper division standing.

## Geog 375U- Maps, Culture and Society (4)

Explores mapping as a way of understandinghuman geography. We discuss how maps are embedded in social context, and how they shape the places and spaces in which we live. Topics includehis torical, cultural, and contemporary usage of maps, the power of maps and critical cartography, participatory mapping and mental maps, and changing mapping technologies.

Geog 380L - Lab for Geog 380 (0)
Lab for Geog 380.
Corequisite: Geog 380U.

## Geog 380U- Maps and Geographic Information (4)

Examines maps as communicative tools, analytical devices, and cultural artifacts. Fundamental concepts such as scale, projection, coordinate systems, are reviewed and applied to higher level measurement and analytical methods with thematic and topographic maps. The data requirements and information content of maps are considered with respect to emerging digital geo-spatial technology.
Corequisite: Geog 380L.

## Geog 397 - Visualization of Spatial Data (4)

The use of graphic modes for visualizing data as a fundamental toolin geography and other disciplines. Topics include graphic types, bar charts, line graphs, pie graphs, time series, flow charts, organizational charts, scales of meas urement, datatran sformations, and index numbers. Specialemphasis on elements of graphic design and design choices in spreadsheets.
Prerequisite: upper-division standing.

## Geog 399 - Special Studies (1-6)

See department for course description. (Credit to be arranged.)

## Geog 399U- Special Studies (1-4)

(Credit to be arranged.)

## Geog 401 - Research (0-6)

See department for course description. (Credit to be arranged.) Consent of ins tructor.

## Geog 403 -Thesis (1-6)

See department for course description. (Credit to be arranged) Consent of instructor.

## Geog 404 - Cooperative Education/Internship (0-12)

See department for course description. (Credit to be arranged.) Pass/no pass only. Consent of instructor.

## Geog 405 - Reading and Conference (0-6)

See department for course description. (Credit to be arranged.) Consent of instructor.

## Geog 407 -Seminar (0-6)

See department for course description. (Credit to be arranged.)

## Geog 409-Practicum(0-12)

See department for course description. (Credit to be arranged.) Pass/no pass only. Consent of instructor.

## Geog 410 -Selected Topics (0-6)

See department for course description. (Credit to be arranged.)

Geog 412 - Global Climate Change Science andSocioenvironmental Impact Assessment (4)
Examination of the physical processes of climate change at multiple scales. Evaluation of the potential impacts of climate change on ecosystem, water, human health in urban and non-urban environments. Understanding of integ rated models for climate change impact as sessment.

Also offered for graduate-level credit as Geog 512 and may be taken only once for credit. . Prerequis ite: Senior or graduate standing in Geography.

## Geog 413 -Disturbance Biogeography of Pacific

 Northwest (4)Dis turbances are important natural components of all ecos ystems, including those in the Pacific Northwest. Disturbances also present risks to human society, yet these are difficult to as sess, prevent and predict. This course will serve as an introduction to disturbance ecology in terrestrial ecosystems in the PNW (i.e. from theory to human modifications of nature), including volcanoes, insect outbreaks, wildfires, landslides, earthquakes, and
floods among others. The course includes at least one mandatory day field trip.

Also offered for graduate-level credit as Geog 513 and may be taken only once for credit. . Prerequisite: Geog 210; Geog 313 or Bi 351 or Geog 313U.

## Geog 414 - Hydrology (4)

A detailed analysis of the physical processes of the hydrologic cycle, emphasizing an applied approach for the purposes of resource management and environmental analys is: precipitation, runoff processes, evapotranspiration, soil water, flooding and floodplain utilization, and techniques of hydrologic data analysis. Expected preparation: Geog 210 and Stat 243 and Stat 244.

Also offered for graduate-level credit as Geog 514 and may be taken only once for credit. .

## Geog 415 -Soils andLand Use (4)

The origin, development and distribution of soils and the significance of soil to man. Examines the importance of soil to landforms, vegetation, and ecological development. Majoremphas is is given to land use potentials and limitations on various kinds of soils with focus on urban and agricultural settings. There are two half-day field trips . Expected preparation: Geog 210.

Also offered for graduate-level credit as Geog 515 and may be taken only once for credit. .

Geog 418 - Landscape Ecology (4)
Examines the structure, function, and change of natural and human-modified communities at the scale between individual communities and regional biomes. Focuses on spatial patterns and processes as they relate to the patch mosaic of interacting ecological communities. This is the same course as ESM 418 and may be taken only once for credit. Expected preparation: Geog 313 or Bi 357. Upperdivision standing required.
Also offered for graduate-level credit as Geog 518 and may be taken only once for credit. Cross-Listed as:ESM 418.

## Geog 420 - Field Methods in Physical Geography (4)

Introduces students to field methods in physical geography. The goal is to familiarize the student with field techniques including research and sampling design, field measurements and mapping, data analysis and report writing and the use of field equipment. Field and lab exercises will focus on the examination of natural patterns and processes and those resulting fromhuman activity. Techniques involving vegetation sampling, soil description, microclimatic conditions, and geomorphologic processes will be covered. Expected preparation: eight hours of upper division physical geography or graduate standing.

Also offered for graduate-level credit as Geog 520 and may be taken only once for credit. .

## Geog 425 -Field Methods in Human Geography (4)

Field observation, description, and analysis in human geography. Students explore landscapes in Portland metropolitan region through a series of exercises including sampling techniques, field mapping, and photog raphy supplemented by data collection fromcensus records, tax records, his toric maps and photographs, and published accounts about places. Expected preparation: 8 credits of upper division or regional geography or graduatestanding.

Also offered for graduate-level credit as Geog 525 and may be taken only once for credit. .

## Geog 430 - Cultural Geography (4)

Explores cultural geography as a subfield of the discipline. Examines the major organizing concepts of cultural geography --cultural ecology, region, landscape, symbolis $m$. Focus is on how these concepts are used in cultural geography, the evolution of research in each area, how the use and application of the concepts havechanged over time, current theoretical developments, and how this subfield of geography fits into the discipline. Includes field work project. Expected preparation: Geog 230.

Also offered for graduate-level credit as Geog 530 and may be taken only once for credit. .

## Geog 432 - Urban Landscapes (4)

Analysis of the contemporary built environment of metropolitan areas; social, cultural, political, and economic forces that have given cities their form and image; his torical processes of urban development; and messages and meanings of our surroundings. Focuses on common urban landscapes as well as designed spaces. In individual and group projects, students analyze the interrelationships of land use, residential density, street patterns, homes and yards, and open spaces in the Portland metropolitan area. Expected preparation: Geog 332.

Also offered for graduate-level credit as Geog 532 and may be taken only once for credit. .

## Geog 440 - The Ecology \& Management of Wildfire (4)

A field-based class offered jointly by the Departments of EnvironmentalScience Management and Geography. This class focuses on the complexchallenges of managing wildfire in integrated social and ecological systems (SESs) and uses the western US as case study to focus on the biophysical and social science behind those challenges. The course adds field studies in NE Oregon to understand how integrated SESs manage wildfire and wildfire risks in practice.

Also offered for graduate-level credit as Geog 540 and may be taken only once for credit. Prerequisite: Upperdivision standing. Corequisite: None. Cross-Listed as: This
is the same course as ESM 440 and may be taken only once for credit.

## Geog 442 - Sus tainable Cities (4)

Examines efforts to create sustainable cities in the United States, drawing on ideas fromaround the world. Explores complexities of balancing social justice with environmentalhealth and economic vitality. Topics include urban ecology and green city initiatives, new ideas in designing the built environment, growth management and land use planning, community-based efforts to improve quality of life, and challenges of globalization for local economies. Includes fieldwork project, half-day field trips, and community based learning option. Expected preparation: Geog 332 or Geog 432; USP 311 or USP 313.

Also offered for graduate-level credit as Geog 542 and may be taken only once for credit. .

## Geog 445 - Resource Management Topics (4)

Focuses on advanced topics in adminis tration and management of natural res ources. Reviews historical issues and today's struggles for a sus tainable approach in the development of natural resource policy. Emphasis will vary, e.g. water resources, energ y resources, public lands. Course may be repeated once for a total of 8 credits with different topics.
Also offered as graduate-level credit as Geog 545 and may be taken only oncefor credit. . Prerequisite: upper-division standing.

## Geog 446 - Water Res ource Management (4)

Analysis of the distribution, use and management of water resources, emphasizing the systems of water rights, legislation, and regulations which govern water res ources. Is sues of water development and water quality are examined. Focus is on U.S. water resource, with case studies fromother countries and regions. Examples are drawn from local, regional, and international water resourcemanagement schemes. Expected preparation: upperdivision standing.
Also offered for graduate-level credit as Geog 546 and may be taken only once for credit. .

## Geog 447 - Urban Streams (4)

Investigates is sues associated with human dimensions of streams in the urban environment. Topics include the role of streams in the built environment, human modifications of streamsystems and their consequences (e.g., disappearing streams, channelization), and local community responses to restore and protect urban streams. Case studies are drawn fromnational and international streams as well as local streams in the Portland metropolitan area. Expected preparation: Geog 345 or Geog 347 or Geog 432.

Also offered for graduate-level credit as Geog 547 and may be taken only once for credit. .

## Geog 448 - The Urban Forest (4)

Examination of issues related to trees in the urban environment. Topics will include the values and roles of urban trees, species identification, site selection, spatial structure of the urban forest, management and regulation of urban trees, and techniques forevaluating the health of the urban forestand public and governmental efforts to promote urban trees. Expected preparation: one or more of Geog 313, Geog 413, Geog 415, Geog 432, Bi 357.
Also offered for graduate-level credit as Geog 548 and may be taken only once for credit. .

## Geog 449 - Geography of Food (4)

This class explores the geography of food: food production, distribution, preparation, and consumption; food politics, markets, urban and commercial farming; food movements, connections of cuisines and regions, and foods and farming in the Pacific Northwest.

Also offered as graduate-level credit as Geog 549 and may be taken only once for credit. . Prerequisite: Upperdivision or graduate standing.

## Geog 462 -Sense of Place (4)

Places are created by people, infused with meaning, and tied to pers onal experience. This course explores meaning in landscapes and identity in places, regions, and localities. It looks at places through three frameworks: place description and depiction (in media images, popular narratives, scholarly writings, photography, and art); the meanings and messages of places; and our personal experience and connections to places. Topics include: the distinctiveness of places, bioregional influences, personal memory and place, creating meaning in places, globallocal tensions, territoriality, and contested places.
Also offered for graduate-level credit as Geog 562 and may be taken only once for credit.

Geog 465 - Tuscany: Sustainability in City and Country (4)

Explores historic and contemporary connections between city and country in Tuscany within a framework of environmental, social, and economic sustainability. Topics include rural land use, sustainable agriculture and forestry, food production and food networks, agritouris $m$, landscape stewardship, urban design, and alternative energy production. Examines international transferability of sustainability concepts. Expected preparation: junior/senior or graduate class standing; relevant experience; permis sion of instructor.

Also offered for graduate-level credit as Geog 565 and may be taken only once for credit. .

## Geog 467-Community Resilience in CoupledSocioEcological Systems (4)

Examines community vulnerability, adaptation, and resilience to environmental risks and hazards in the coupled human and natural systems froma geographical and spatial science perspective. Focuses on US and international case studies in major urban areas to investigate the questions of "why, when, for whom, and how" of community resilience across scales.
Also offered for graduate-level credit as Geog 567 and may be taken only once for credit. Prerequisite: Geog 230.

## Geog 472 - Critical GIS (2)

Explores the connections between GIS and the society it represents and serves, and the hidden implications embedded within GIS technology. In vestig ates whether GIS can be developed to reflect more complex perceptions of space and place that are not based on traditional mapping forms. Topics also include the implications of ongoing technological change, the democratization of mapping, and the ethics of GIS practice as well as the acces sibility of GIS data and tools to all.
Also offered for graduate-level credit as Geog 572 and may be taken only once for credit. Prerequisite: Geog 488 or equivalent.

## Geog 475 - Digital Compilation and Database Design (4)

Class in applied geographic information systems featuring the project development of new digital geo-spatial data. Students learn to digitize existing map documents, design information databases to be used with these data, and employ a standardized documentation format to describe the database.

Also offered for graduate-level credit as Geog 575 and may be taken only once for credit. . Prerequisite: Geog 488/588, prior or concurrent enrollment in Geog 492/592.

## Geog 476 - 3D Terrain Analysis \& Visualization (2)

Introduction to the theory and methods of the analysis and visualization of 3D digital elevation data. Topics include GIS terrain data models, terrain surface analysis, watershed delineation, and 3D visualization. Computer lab included.

Also offered for graduate-level credit as Geog 576 and may be taken only once for credit. Prerequisite: Upperdivision standing.

## Geog 477 - Photogrammetry and LiDAR (2)

Introduction to the generation, compilation, and applications of digital elevation data derived from photogrammetry and LiDAR. Topics includeUAS, digital photogrammetry, structure frommotion, and LiDAR data processing. Computer lab included.

Also offered for graduate-level credit as Geog 577 and may be taken only once for credit. Prerequisite: Upperdivision standing.

## Geog 480 - Remote Sensing and Image Analysis (4)

Visual interpretation and meas urement fromremotely sensed imagery used for mapping and spatial data development. Analysis of air photo pattern recognition and scale dis tortions. Examination of various satellite imaging platforms and product characteristics.
Also offered for graduate-level credit as Geog 580 and may be taken only once for credit. . Prerequisite: Geog 380U.

## Geog 481 -Digital Image Analysis I: Introduction (4)

Interpretation and measurement fromdigital satellite imagery used for interpretation of the earth's surface. Analysis will be largely based on the application of computer technology to imagery. The emphasis will be on natural landforms and vegetative cover. Expected preparation: Geog 480.
Also offered for graduate-level credit as Geog 581 and may be taken only once for credit. .

## Geog 482 - Digital Image Analysis II: Advanced Remote Sensing (4)

Advanced topics in digital remote sensing including image classification methods for geographic information extraction, digital change detection methods for meas uring land use/land cover change, and advanced algorithms for digital image analysis. Includes computer exercises in classification and change detection using leading image processing software packages.
Also offered for graduate-level credit as Geog 582 and may be taken only once for credit. . Prerequisite: Geog 481.

## Geog 484 - Cartographic Applications of GIS <br> (4)

Provides a general introduction to GIS by focusing on the mapmaking capabilities of GIS software. Topics include basic cartographic principles of visual communication and representation, how to turn geographic datasets into effective maps both for print and the web, and how to critique maps.
Also offered for graduate-level credit as Geog 584 and may be taken only once for credit. . Prerequisite: Geog 380U.

## Geog 485 - Map Design and Production (4)

Introduction to the planning and execution of a map, with specialemphasis on the arrangement of its graphic elements. Students will use cartographic and illus tration software in the compilation, design and production of maps.

Also offered as graduate-level credit as Geog 585 and may be taken only once for credit. . Prerequisite: Geog 380U and Geog 484 or Geog 488 or USP 591.

## Geog 488 - Geographic Information Systems I: Introduction (4)

Introduces the general principles and application of Geographic Information Systems (GIS). Topics include geographic data models, the nature of geographic data, databases, data collection, mapmaking, and s patial analy sis techniques. Students will use GIS software to complete a series of computer lab exercises that demonstrate a variety of approaches to the analy sis and display of spatial data.
Students enrolling in this class als o must register for a computer lab section. This is the same course as USP 591 and may be taken only once for credit.

Also offered for graduate-level credit as Geog 588 and may be taken only once for credit. . Prerequisite: Geog 380 U or equivalent experience. Corequisite: Geog 488L. Cross-Listed as: USP 591.

Geog 488L - GIS Lab (0)
Lab for G 488.

## Geog 489 - Building a GIS Database with GPS (4)

Develops knowledge and skills necessary to use the global positioning systems (GPS) to collect, process, and use geographic data. GPS theory and techniques through field survey experiences. Collect and integrate spatial and nons patial data within an integrated geographic information system(GIS) framework.
Also offered for graduate-level credit as Geog 589 and may be taken only once for credit. . Prerequisite: Geog 488.

## Geog 490 - GIS Programming (4)

Introduction to GIS programming languages for customizing applications and streamlining spatial analysis. Topics include GIS soft ware environment, programming syntax and styles, interfacecustomization, GIS routines and functions, and basic algorithms. Programming lab included.

Also offered for graduate-level credit as Geog 590 and may be taken only once for credit. . Prerequisite: Geog 488.

## Geog 492 - Geographic Information Systems II: Advanced GIS (4)

Analysis and applications of geographic information systems concepts and technology to land planning and management issues. The multipurpose land information systems concept is used as an organizing device for spatial registration of data layers to achieve data sharing and compatibility among functions. User needs assessment and
systems design provides the basis for systems procurement, implementation, and use. Students enrolling in this class also mustregister for a computer lab section. This is the same course as USP 592 and may be taken only once forcredit.

Also offered for graduate-level credit as Geog 592 and may be taken only once for credit. . Prerequisite: Geog 488 or USP 591. Corequis ite: Geog 492L. Cross -Listed as: USP 592.

Geog 492L - GIS II Lab (0)
Lab for G 492.

## Geog 494 - GIS for Water Resources (4)

Applications of Geographic Information Systems (GIS) in hydrology and water resource management. Topics include hydrologic networks, watershed characterization by GIS, river channel modeling with GIS, GIS modeling and visualization of hydrographic data, time-series water resource data representation and analysis in GIS, and is sues in the applications of GIS for watershed management. Expected preparation: Geog 380, Geog 414, and Geog 488.

Also offered for graduate-level credit as Geog 594 and may be taken only once for credit. .
Geog 495 - Maps, Models, and GIS (4)
Analysis and display of spatial data, emphasizing environmental questions within the framework of the raster data model. Topics include an introduction to general systems theory, the nature of models, cartographic model development, modelimplementation procedures, map algebra, vectortoraster data conversion, guidelines for symbolusage, and the incorporation of digital remote sensing data into map models. Expected preparation: Geog 485.

Also offered for graduate-level credit as Geog 595 and may be taken only once for credit. . Prerequisite: Geog 380U.

## Geog 496 - Introduction to Spatial Quantitative Analysis (4)

Introductory course on quantitative geographic inquiry. Focus on fundamental techniques for the analysis of spatial and non-spatial data as applied to geographic problem scenarios. Topics include the nature of data, descriptive statistics, dataexploration, dis tributions, sampling, and statistical inference. Expected preparation: 12 hours of coursework in geography.
Also offered for graduate-level credit as Geog 596 and may be taken only once for credit.

## Geog 497 - Advanced Spatial Quantitative Analysis (4)

Introduction to the principles of inferential spatial statistics. Topics include point pattern analy sis, spatial autocorrelation, spatial interpolation, and multivariate spatial data analy sis.
Also offered for graduate-level credit as Geog 597 and may be taken only once for credit. . Prerequisite: Stat 243 or Geog 496.

## Geog 501 - Research (0-9)

See department for course description. (Credit to be arranged.) Consent of ins tructor.

Geog 502 - Independent Study (1-9)
(Credit to be arranged.)

## Geog 503 - Thesis (0-9)

See department for course description. (Credit to be arranged) Consent of instructor.

## Geog 504 - Cooperative Education/Internship (0-9)

See department for course description. Consent of instructor. (Credit to be arranged.)

## Geog 505 - Reading and Conference (0-6)

See department for course description. (Credit to be arranged.) Consent of ins tructor.

## Geog 506 -Special Projects (1-12)

(Credit to be arranged.)

## Geog 507 -Seminar (0-6)

See department for course description. (Credit to be arranged.)

## Geog 509 - Practicum (0-12)

See department for course description. (Credit to be arranged.) Consent of instructor.

## Geog 510 -SelectedTopics (0-6)

See department for course description. (Credit to be arranged.)

## Geog 512 - Global Climate Change Science andSocioenvironmental Impact Assessment (4)

Examination of the physical processes of climate change at multiple scales. Evaluation of the potential impacts of climate change on ecosystem, water, human health in urban and non-urban en vironments. Understanding of integrated models for climate change impact assessment.
Also offered for undergraduate-level credit as Geog 412 and may be taken only once for credit.

## Geog 513 -Disturbance Biogeography of Pacific Northwest (4)

Dis turbances are important natural components of all ecos ystems, including those in the Pacific Northwest. Disturbances also present risks to human society, yet these are difficult to as sess, prevent and predict. This course will serve as an introduction to disturbance ecology in terrestrial ecosystems in the PNW (i.e. from theory to human modifications of nature), including volcanoes, insect outbreaks, wildfires, landslides, earthquakes, and floods among others. The course includes at least one mandatory day field trip. Expected preparation: Geog 210, Geog 313 or Bio 357.

Also offered for undergraduate-level credit as Geog 413 and may be taken only once for credit. .

## Geog 514 -Hydrology (4)

A detailed analysis of the physical processes of the hydrologic cycle, emphasizing an applied approach for the purposes of resource management and environmental analys is: precipitation, runoff processes, evapotranspiration, soil water, flooding and floodplain utilization, and techniques of hydrologic data analysis.

Also offered for undergraduate-level credit as Geog 414 and may be taken only once for credit. .
Geog 515 -Soils andLand Use (4)
The origin, development and distribution of soils and the significance of soilto man. Examines the importance of soil to landforms, vegetation, and ecological development.
Major emphas is is given to land use potentials and limitations on various kinds of soils with focus on urban and agricultural settings. There are two half-day field trips.
Also offered for undergraduate-levelcredit as Geog 415 and may be taken only once for credit. .

## Geog 518 -Lands cape Ecology (4)

Examines the structure, function, and change of natural and human-modified communities at the scale between individual communities and regional biomes. Focuses on spatial patterns and processes as they relate to the patch mosaic of interacting ecological communities. This is the
same course as ESM 518 and may be taken only once for credit.

Also offered for undergraduate-level credit as Geog 418 and may be taken only once for credit. Cross-Listed as: ESM 518.

## Geog 520 - Field Methods in Physical Geography (4)

Introduces students to field methods in physical geography. The goal is to familiarize the student with field techniques including research and sampling design, field measurements and mapping, data analy sis and report writing and the use of field equipment. Field and lab exercises will focus on the examination of natural patterns and processes and those resulting fromhuman activity. Techniques involving vegetation sampling, soil description, microclimatic conditions, and geomorphologic processes will be covered.
Also offered for undergraduate-level credit as Geog 420 and may be taken only once for credit. .

## Geog 521 - Geographic Thought (4)

Geography as a professional field. The first half of the course deals with thehistory of geographic thou ght and literature. The second half focuses on the role of geography among the arts and sciences and on more recent developments in the field. Required of all graduate students in geography.

## Geog 522 - Research Design (4)

A guided programfor preparing graduate research papers and theses in geography. Attention is given to formulating topics, developing hypotheses, determining researchability, acquiring and analyzing data, developing conclusions, and org anizing and writing reports. Required of all graduate students in geography.

## Geog 523 - Geographic Research and Applications (1)

Applications of theory and method in geography through discussion of faculty research; relates theoretical underpinnings of the discipline to faculty research agendas, broadens perspectives on geographical research questions. Required of all geography graduate students.

## Geog 525 - Field Methods in Human Geography (4)

Field observation, description, and analysis in human geography. Students explore landscapes in Portland metropolitan region through a series of exercises including sampling techniques, field mapping, and photography supplemented by data collection fromcensus records, tax records, his toric maps and photographs, and published accounts about places.

Also offered for undergraduate-levelcredit as Geog 425 and may be taken only once for credit. .

## Geog 530 - Cultural Geography (4)

Explores cultural geography as a subfield of the discipline. Examines the major organizing concepts of cultural geography --cultural ecology, region, landscape, symbolism. Focus is on how these concepts are used in cultural geography, the evolution of research in each area, how the use and application of the concepts havechanged over time, current theoretical developments, andhow this subfield of geography fits into the discipline. Includes field work project.
Also offered for undergraduate-levelcredit as Geog 430 and may be taken only once for credit. .

## Geog 532 - Urban Landscapes (4)

Analysis of the contemporary built environment of metropolitan areas; social, cultural, political, and economic forces that have given cities their form and image; his torical processes of urban development; and mes sages and meanings of our surroundings. Focuses on common urban landscapes as well as designed spaces. In individual and group projects, students analyze the interrelationships of land use, residential density, street patterns, homes and yards, and open spaces in the Portland metropolitan area.
Also offered for undergraduate-level credit as Geog 432 and may be taken only once for credit. .

## Geog 540 - The Ecology and Management of Wildfire

 (4)A field-based class offered jointly by the Departments of EnvironmentalScience Management and Geography. This class focuses on the complexchallenges of managing wildfire in integrated social and ecological systems (SESs) and uses the western US as case study to focus on the biophysical and social science behind those challenges. The course adds field studies in NE Oregon to understand how integrated SESs manage wildfire and wildfire risks in practice.
Also offered for undergraduate-level credit as GEOG 440 and may be taken only once for credit. Cross-Listed as: This is the same course as ESM 540 and may be taken only once forcredit.

## Geog 542 -Sustainable Cities (4)

Examines efforts to create sustainable cities in the United States, drawing on ideas fromaround the world. Explores complexities of balancing social justice with environmental health and economic vitality. Topics include urban ecology and green city initiatives, new ideas in designing the built environment, growth management and land use planning, community-based efforts to improve quality of life, and challenges of globalization for local
economies. Includes fieldwork project, half-day field trips, and community based learning option.

Also offered for undergraduate-level credit as Geog 442 and may be taken only once forcredit. .

## Geog 545 - Res ource Management Topics (4)

Focuses on advanced topics in administration and management of natural resources. Reviews his torical issues and today's struggles for a sustainable approach in the development of natural resource policy. Emphasis will vary, e.g. water res ources, energ y resources, public lands. Course may be repeated once for a total of 8 credits with different topics.
Also offered as undergraduate-level credit as Geog 445 and may be taken only once for credit. .

## Geog 546 - Water Resource Management (4)

Analysis of the distribution, useand management of water resources, emphasizing the systems of water rights, legislation, and regulations which govern water res ources. Is sues of water development and water quality are examined. Focus is on U.S. water resource, with case studies fromother countries and regions. Examples are drawn from local, regional, and international water resourcemanagementschemes.

Also offered for undergraduate-level credit as Geog 446 and may be taken only once forcredit. .

## Geog 547 - Urban Streams (4)

Investigates is sues associated with human dimensions of streams in the urban environment. Topics include the role of streams in the built environment, human modifications of streams ystems and their consequences (e.g., disappearing streams, channelization), and local community responses to restore and protect urban streams. Case studies are drawn fromnational and international streams as well as local streams in the Portland metropolitan area.

Also offered for undergraduate-level credit as Geog 447 and may be taken only once for credit. .

## Geog 548 - The Urban Forest (4)

Examination of issues related to trees in the urban environment. Topics will include the values and roles of urban trees, species identification, site selection, spatial structure of the urban forest, management and regulation of urban trees, and techniques for valuating the health of the urban forest and public and governmental efforts to promote urban trees.
Also offered for undergraduate-level credit as Geog 448 and may be taken only once for credit. .

## Geog 549 - Geography of Food (4)

This class explores the geography of food: food production, distribution, preparation, and consumption; food politics, markets, urban and commercial farming; food movements, connections of cuisines and regions, and foods and farming in the Pacific Northwest.
Also offered as undergraduate-level credit as Geog 449 and may be taken only once for credit. .

## Geog 562 -Sense of Place (4)

Places are created by people, infused with meaning, and tied to pers onal experience. This course explores meaning in landscapes and identity in places, regions, and localities. It looks at places through three frameworks: place description and depiction (in media images, popular narratives, scholarly writings, photography, and art); the meanings and messages of places; and our personal experience and connections to places. Topics include: the distinctiveness of places, bioregional influences, personal memory and place, creating meaning in places, globallocal tensions, territoriality, and contested places.
Also offered for undergraduate-levelcredit as Geog 462 and may be taken only once for credit.

Geog 565 - Tuscany: Sustainability in City and Country (4)

Explores historic and contemporary connections between city and country in Tuscany within a framework of environmental, social, and economic sustainability. Topics include rural land use, sustainable agriculture and forestry, food production and food networks, agritouris m, landscape stewardship, urban design, and alternative energy production. Examines international transferability of sustainability concepts.
Also offered for undergraduate-levelcredit as Geog 465 and may be taken only once for credit. .

## Geog 567 - Community Resilience in CoupledSocioEcological Systems (4)

Examines community vulnerability, adaptation, and resilience to environmental risks and hazards in the coupled human and natural systems froma geographical and spatial science perspective. Focuses on US and international case studies in major urban areas to investigate the questions of "why, when, for whom, and how" of community resilience across scales.
Also offered for undergraduate-level credit as Geog 467 and may be taken only once for credit. Cross-Listed as: This course is the same as EMCR 567 and may be taken only once for credit.

## Geog 572 - Critical GIS (2)

Explores the connections between GIS and the society it represents and serves, and the hidden implications
embedded within GIS technology. Investig ates whether GIS can be developed to reflect more complex perceptions of space and place that are not based on traditional mapping forms. Topics also include the implications of on going technological change, the democratization of mapping, and the ethics of GIS practice as well as the acces sibility of GIS data and tools to all.

Also offered for undergraduate-level credit as Geog 472 and may be taken only once for credit. Prerequisite: Geog 588 or equivalent.

## Geog 574 - Methods and Models in Socio-ecological Systems (4)

Evaluates changing socioecological systems in a holistic way, drawing multiple disciplines, including ecology, economics, engineering, and geographical and spatial sciences. Introduces methods and models frommultiple disciplines to analyze socioecological sy stems across biophysical, social, economic, and cultural contexts. Provides an interdisciplinary foundation for evaluating socioecological systems. Expected preparation: 12 hours of coursework in upper-level social and physical sciences.
Also offered as Geog 674 and may be taken only once for credit.

## Geog 575 - Digital Compilation and Database Design

 (4)Class in applied geographic information systems featuring the project development of new digital geo-spatial data. Students learn to digitize existing map documents, design information databases to be used with these data, and employ a standardized documentation format to describe the database.

Also offered for undergraduate-level credit as Geog 475 and may be taken only once for credit. . Prerequis ite: Geog 488/588, prior or concurrent enrollment in Geog 492/592.
Geog 576 - 3D Terrain Analysis \& Visualization (2)
Introduction to the theory and methods of the analysis and visualization of 3D digital elevation data. Topics include GIS terrain data models, terrain surface analysis, watershed delineation, and 3D visualization. Computer lab included.
Also offered for undergraduate-level credit as Geog 476 and may be taken only once for credit. Prerequisite: Geog 588.

## Geog 577 - Photogrammetry and LiDAR (2)

Introduction to the generation, compilation, and applications of digital elevation data derived from photogrammetry and LiDAR. Topics include UAS, digital photogrammetry, structure frommotion, and LiDAR data processing. Computer lab included.

Also offered for undergraduate-level credit as Geog 477 and may be taken only once for credit. Prerequisite: Geog 588.

Geog 580 - Remote Sensing and Image Analysis (4)
Visual interpretation and measurement fromremotely sensed imagery used for mapping and spatial data development. Analysis of air photo pattern recognition and scale distortions. Examination of various satellite imaging platforms and product characteristics.
Also offered for undergraduate-levelcredit as Geog 480 and may be taken only once for credit. .

Geog 581 -Digital Image Analysis I: Introduction (4)
Interpretation and measurement fromdigital satellite imagery used for interpretation of the earth's surface. Analysis will be largely based on the application of computer technology to imagery. The emphasis will be on natural landforms and vegetative cover.
Also offered for undergraduate-levelcredit as Geog 481 and may be taken only once for credit. .

## Geog 582 - Digital Image Analysis II: Advanced Remote Sensing (4)

Advanced topics in digital remote sensing including image classification methods for geographic information extraction, digital change detection methods for meas uring land use/land cover change, and ad vanced algorithms for digital image analysis. Includes computer exercis es in classification and change detection using leading image processing software packages.
Also offered for undergraduate-level credit as Geog 482 and may be taken only once for credit. . Prerequisite: Geog 481/581.

## Geog 584 - Cartographic Applications of GIS <br> (4)

Provides a general introduction to GIS by focusing on the mapmaking capabilities of GIS software. Topics include basic cartographic principles of visual communication and representation, how to turn geographic datasets into effective maps both for print and the web, and how to critique maps.
Also offered for undergraduate-levelcredit as Geog 484 and may be taken only once for credit. .

## Geog 585 -Map Design and Production (4)

Introduction to the planning and execution of a map, with special emphasis on the arrangement of its graphic elements. Students will use cartographic and illustration software in the compilation, design and production of maps.
Also offered as undergraduate-level credit as Geog 485 and may be taken only once for credit. . Prerequisite: Geog 380U and Geog 484/584 or Geog 488/588 or USP 591.

## Geog 588 - Geographic Information Systems I: Introduction (4)

Introduces the general principles and application of Geographic Information Systems (GIS). Topics include geographic data models, thenature of geographic data, databases, data collection, mapmaking, and spatial analy sis techniques. Students will use GIS software to complete a series of computer lab exercises that demonstrate a variety of approaches to the analy sis and display of spatial data. Students enrolling in this class also must register for a computer lab section. This is the same course as USP 591 and may be taken only once for credit.
Also offered for undergraduate-level credit as Geog 488 and may be taken only once for credit. . Corequisite: Geog 588L. Cross-Listed as: USP 591.

Geog 588L - GIS Lab (0)
Lab for G 588.

## Geog 589 - Building a GIS Database with GPS (4)

Develops knowledge and skills necessary to use the global positioning systems (GPS) to collect, process, and use geographic data. GPS theory and techniques through field survey experiences. Collect and integrate spatial and nons patial data within an integrated geographic information system(GIS) framework.
Also offered for undergraduate-level credit as Geog 489 and may be taken only once for credit. . Prerequisite: Geog 488/588.

## Geog 590 - GIS Programming (4)

Introduction to GIS programming languages for customizing applications and streamlining spatial analysis. Topics include GIS soft ware environment, programming syntax and styles, interfacecustomization, GIS routines and functions, and basic algorithms. Programming lab included.

Also offered for undergraduate-level credit as Geog 490 and may be taken only once for credit. . Prerequisite: Geog 488/588.

## Geog 591 - Professionalismin GIS (2)

Students meet in a seminar format to learn from each other, from faculty members, from community partners, and from other experts and practitioners in the field of Geographic Information System. Presentations, dialogue, and case exploration will offer learning about current is sues and practices in the GIS industry. Topics will include the GIS body of knowledge, trends in the field, community activities, professionalization, GIS ethics, and the many practical dimensions of GIS as a career path.
Prerequis ite: Geog 588.

## Geog 592 - Geographic Information Systems II: Advanced GIS (4)

Analysis and applications of geographic information systems concepts and technology to land planning and management is sues. The multipurpose land information systems concept is used as an organizing device for spatial registration of data layers to achieve data sharing and compatibility among functions. User needs assessment and systems design provides the basis for systems procurement, implementation, and use. Students enrolling in this class also must register for a computer lab section. This is the same course as USP 592 and may be taken only once forcredit.
Also offered for undergraduate-level credit as Geog 492 and may be taken only once for credit. . Prerequisite: Geog 488/588 or USP 591. Corequisite: Geog 592L. CrossListed as: USP 592.
Geog 592L - GIS II Lab (0)
Lab for G 592.

## Geog 594 - GIS for Water Res ources (4)

Applications of Geographic Information Sy stems (GIS) in hydrology and water resource management. Topics include hydrologic networks, watershed characterization by GIS, river channel modeling with GIS, GIS modeling and visualization of hydrographic data, time-series water resource data representation and analysis in GIS, and is sues in the applications of GIS for watershed management.
Also offered for undergraduate-levelcredit as Geog 494 and may be taken only once for credit. .

## Geog 595 -Maps, Models, and GIS (4)

Analysis and display of spatial data, emphasizing environmental questions within the framework of the raster data model. Topics include an introduction to general systems theory, thenature of models, cartographic model development, modelimplementation procedures, map algebra, vectortoraster data conversion, guidelines for symbolusage, and the incorporation of digital remote sensing data into map models. Expected preparation Geog 485/585.

Also offered for undergraduate-levelcredit as Geog 495 and may be taken only once for credit. .

## Geog 596 - Introduction to Spatial Quantitative Analysis (4)

Introductory course on quantitative geographic inquiry. Focus on fundamental techniques for the analysis of spatial and non-spatial data as applied to geographic problem scenarios. Topics include the nature of data, descriptive statistics, data exploration, dis tributions, sampling, and
statistical inference. Expected preparation: 12 hours of coursework in geography.

Also offered for undergraduate-level credit as Geog 496 and may be taken only once for credit. .
Geog 597 - Advanced Spatial Quantitative Analysis (4)
Introduction to the principles of inferential spatial statistics. Topics include point pattern analysis, spatial autocorrelation, spatial interpolation, and multivariate spatial data analy sis.
Also offered for undergraduate-level credit as Geog 497 and may be taken only once for credit. . Prerequisite: Stat 243 or Geog 496.
Geog 601 - Research (0-12)
See department for course description. (Credit to be arranged.)

## Geog 603 - Dissertation (0-12)

See department for course description. (Credit to be arranged.)

## Geog 605 - Reading and Conference (0-8)

See department for course description. (Credit to be arranged.)

## Geog 607 -Seminar (0-12)

See department for course description. (Credit to be arranged.)

## Geog 674 - Methods and Models in Socio-ecological Systems (4)

Evaluates changing socioecological systems in a holistic way, drawing multiple disciplines, including ecology, economics, engineering, and geographical and spatial sciences. Introduces methods and models frommultiple disciplines to analyze socioecological sy stems across biophysical, social, economic, and cultural contexts. Provides an interdisciplinary foundation for evaluating socioecological systems. Expected preparation: 12 hours of cours ework in upper-level social and physical sciences.

Als o offered as Geog 574 and may be taken only once for credit.

## Ger - Germanic Languages

Ger 101 - First-Year German Term 1 (4)
Beginning German. Emphasis on communication skills: listening, speaking, reading, writing. This is the first course in a sequence of three: Ger 101, Ger 102, and Ger 103.

## Ger 102 - First-Year German Term 2 (4)

Beginning German. Emphasis on communication skills: listening, speaking, reading, writing. This is the second course in a sequenceof three: Ger 101, Ger 102, and Ger 103.

## Ger 103 - First-Year German Term 3 (4)

Beginning German. Emphas is on communication skills: listening, speaking, reading, writing. This is the third course in a sequence of three: Ger 101, Ger 102, and Ger 103.

## Ger 150 - First-year German (Intensive) (6)

A two-termcourse covering the content of Ger 102, 102, 103.

Ger 151 - First-year German (Intensive) (6)
A two-termcourse covering the content of Ger 102, 102, 103.

Ger 199 - Special Studies (0-6)
(Credit to be arranged.)

## Ger 201 -Second-Year German Term1 (4)

Intensive review of basics introduced in first year courses and further development of communication skills. This is the first course in a sequence of three: Ger 201, Ger 202, and Ger 203. Expected preparation: Ger 103.

Ger 202 -Second-Year German Term2 (4)
Intensive review of basics introduced in first year courses and further development of communication skills. This is the second course in a sequence of three: Ger 201, Ger 202, and Ger 203. Expected preparation: Ger 103.

Ger 203 -Second-Year German Term3 (4)
Intensive review of basics introduced in first year courses and further development of communication skills. This is the third course in a sequence of three: Ger 201, Ger 202, and Ger 203. Expected preparation: Ger 103.

Ger 299 -Special Studies (1-12)
(Credit to be arranged.)

## Ger 301 - Third-Year German Term 1 (4)

Continued development of speaking, listening, reading and writing skills through study of appropriate texts, conversation, activities, and written assignments. This is the first course in a sequence of three: Ger 301, Ger 302, and Ger 303. Expected preparation: Ger 203.

## Ger 302 - Third-Year German Term 2 (4)

Continued development of speaking, listening, reading and writing skills through study of appropriate texts, conversation, activities, and written assignments. This is the second course in a sequence of three: Ger 301, Ger 302, and Ger 303. Expected preparation: Ger 203.

Ger 303 - Third-Year German Term 3 (4)
Continued development of speaking, listening, reading and writing skills through study of appropriate texts, conversation, activities, and written assignments. This is the third course in a sequence of three: Ger 301, Ger 302, and Ger 303. Expected preparation: Ger 203.

## Ger 320 - German for the Working World(4)

Intensive application of language for advanced everyday proficiency, career exploration, and employment. Exploration of German-speaking companies: business practices, corporate structure, human res ources, product development, marketing, finance, law, cultural as pects. Development of skills in different modes of communication as appropriate in business settings. Handson development of simulated or actual student-run companies. Expected preparation: Ger 203.

## Ger 325 - German Phonetics andPhonology (4)

330Introduction to the sounds of German: their place and manner of articulation (phonetics) as well as how they pattern with respect to each other and as influenced by morphological and syntactic factors (phonology). Conducted in English. Expected preparation: Ger 203.

## Ger 330 - Topics in Culture and Civilization (4)

Study of the his torical development of life, thought, and the arts in German-speaking lands in times and places such as the Middle Ages, 19th-century Vienna, 20th-century Berlin, the Weimar period, the present, or in fields such as film. Expected preparation: Ger 203.

Ger 340 - Fundamentals of German Literary Studies (4)

An introduction to the study of German literature. Lectures and discussion on German prosody, genres, fundamentals of literary analys is and criticism. Expected preparation: Ger 203.

## Ger 341 U - Introduction to German Literature (4)

Readings fromrepresentative German authors fromthe Middle Ages to the present. This is the first course in a sequence of two: Ger 341 and Ger 342. Expected preparation: Ger 203.

## Ger 342 - Introduction to German Literature (4)

Readings fromrepresentative German authors fromthe Middle Ages to the present. This is the second course in a sequence of two: Ger 341 and Ger 342. Expected preparation: Ger 203.

## Ger 399 - Special Studies (1-12)

(Credit to be arranged.)

## Ger 401 - Research (1-9)

(Credit to be arranged.)

Ger 404 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

Ger 405 - Reading and Conference (1-12)
(Credit to be arranged.)

## Ger 407 -Seminar (1-12)

(Credit to be arranged.)

Ger 408 - Workshop(1-12)
(Credit to be arranged.)

Ger 409 - Practicum(1-12)
(Credit to be arranged.)

Ger 410 -Selected Topics (1-12)
(Credit to be arranged.)

## Ger 411 - Advanced German (4)

Special features of German; selected writing and reading as signments, discussion. This is the first course in a sequence of two: Ger 411 and Ger 412. Expected preparation: Ger 302.

Also offered for graduate-level credit as Ger 511 and may be taken only once for credit. .
Ger 412 - Advanced German (4)
Special features of German; selected writing and reading assignments, discussion. This is the second course in a sequence of two: Ger 411 and Ger 412. Expected preparation: Ger 302.
Also offered for graduate-level credit as Ger 512 and may be taken only once for credit. .

Ger 414 -Advanced German Grammar (4)
Structural review of German morphology and syntax. Expected preparation: Ger 302.
Also offered for graduate-level credit as Ger 514 and may be taken only once for credit. .

## Ger 415 - Business German (4)

Advanced work in the language of business and economics. Expected preparation: Ger 302.

Ger 420 - German for the Working World(Advanced) (4)

Intensive application of language for upper-level advanced proficiency, career exploration, and employment. Exploration of German-speaking companies: business practices, corporate structure, human resources, product development, marketing, finance, law, cultural as pects. Development of skills in different modes of communication as appropriate in business settings. Handson development of simulated or actual student-run companies.
Prerequisite: Ger 301 or equivalent whether taken previously or concurrently.

## Ger 421 - German Short Prose (4)

Study of the German Novelle and other shorter prose of the 19th and 20th centuries. Expected preparation: at least 8 credits fromGer 340, Ger 341, or Ger 342.
Also offered for graduate-level credit as Ger 521 and may be taken only once forcredit. .

## Ger 422-18th Century German Literature (4)

Study of the poetry, drama, and prose of the German Enlightenment and the Sturmund Drang. Expected preparation: at least 8 credits fromGer 340, Ger 341, or Ger 342.

## Ger 427 - The Age of Goethe (4)

Study of German poetry, drama, and prosefrom the Sturm und Drang and Classicismto the beginning of
Romanticism. Expected preparation: at least 8 credits from Ger 340, Ger 341, or Ger 342.
Also offered for graduate-level credit as Ger 527 and may be taken only once for credit.

## Ger 428 - German Romanticism (4)

Study of the literature, art, and aesthetic theories of late 18th and 19th century Germany. Expected preparation: at least 8 credits fromGer 340, Ger 341, or Ger 342.

Also offered for graduate-level credit as Ger 528 and may be taken only once forcredit. .

## Ger 429 - German Realism and Naturalism (4)

Study of the poetry, drama, and prose of the second half of the 19th century. Expected preparation: at least 8 credits from Ger 340, Ger 341, or Ger 342.
Also offered for graduate-level credit as Ger 529 and may be taken only once for credit. .

## Ger 433 - German Literature of the 20th Century (4)

Readings in modern poetry, drama, and prose. Ger 433/533: from the turn of the century to the end of World War II; Ger 434/534: from the post-war years to the present. This is the first course in a sequence of two: Ger 433 and Ger 434. Expected preparation: at least 8 credits from Ger 340, Ger 341, or Ger 342.
Also offered for graduate-level credit as Ger 533 and may be taken only once forcredit. .
Ger 434 - German Literature of the 20th Century (4)
Readings in modern poetry, drama, and prose. Ger 433/533: from the turn of the century to theend of World War II; Ger 434/534: from the post-war years to the present. This is the second course in a sequence of two: Ger 433 and Ger 434. Expected preparation: at least 8 credits fromGer 340, Ger 341, or Ger 342.

Also offered for graduate-level credit as Ger 534 and may be taken only once for credit. .

Ger 441U- Major Works in Translation (4)
Study of selections frommasterpieces of German literature in translation, such as Goethe, the Weimar period, German Intellectual History, Ancient Myth in German Literature. Readings, lectures, and discussions in English. Expected preparation: 4 credits of upper division literature.
Also offered for graduate-level credit as Ger 541 and may be taken only once for credit.

Ger 442U - Medieval Works In Translation (4)
Study of texts fromthe German Middle Ages. Readings, lectures, and discussions in English. Recommended prerequisite: 4 credits of upper division literature.

## Ger 484 - German Stylistics (4)

A study of the stylistic as pects of fictional and nonfictional writings within the context of the cultural and philosophical his tory of modern Germany.

Als o offered for graduate-level credit as Ger 584 and may be taken only once for credit.
Ger 490 - History of the German Language (4)
A general historical survey showing the development of German grammar, word formation, vocabulary, and syntax with reference to the his tory of other Germanic languages. Conducted in English. Recommended prerequisite: Ger 302.

## Ger 494 - German Linguistics (4)

Introduction to the basic concepts in linguistics and their application to German. Review of sound system; focus on morphology and syntax. Conducted in English. Expected preparation: Ger 302.
Also offered for graduate-level credit as Ger 594 and may be taken only once for credit. .
Ger 497 - Applied German Linguistics (4)
A practical application of linguis tic method to modern German. Emphas is on contrastive analysis of German and English. Expected preparation: Ger 302 and 4 credits in linguistics.

Also offered for graduate-level credit as Ger 597 and may be taken only once for credit. .
Ger 501 - Research (1-9)
(Credit to be arranged.)

Ger 503 - Thesis (1-9)
(Credit to be arranged.)

Ger 504 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

## Ger 505 - Reading and Conference (1-12)

(Credit to be arranged.)

## Ger 507 -Seminar (1-12)

(Credit to be arranged.)

## Ger 508 - Workshop(1-12)

(Credit to be arranged.)

Ger 509 - Practicum (1-12)
(Credit to be arranged.)

Ger 510 -Selected Topics (1-12)
(Credit to be arranged.)

## Ger 511 - Advanced German (4)

Special features of German; selected writing and reading as signments, discussion. This is the first course in a sequence of two: Ger 511 and Ger 512.
Also offered for undergraduate-level credit as Ger 411 and may be taken only once for credit. .
Ger 512 - Advanced German (4)
Special features of German; selected writing and reading assignments, discussion. This is the second course in a sequence of two: Ger 511 and Ger 512.
Also offered for undergraduate-level credit as Ger 412 and may be taken only once for credit. .
Ger 514 - Advanced German Grammar (4)
Structuralreview of German morphology and syntax.
Also offered for undergraduate-level credit as Ger 414 and may be taken only once for credit. .

## Ger 521 - German Short Prose (4)

Study of the German Novelle and other shorter prose of the 19th and 20th centuries.

Also offered for undergraduate-level credit as Ger 421 and may be taken only once for credit. .

Ger 522-18th Century German Literature (4)
Study of the poetry, drama, and proseof the German Enlightenment and the Sturmund Drang. Expected preparation: at least 8 credits fromGer 340, Ger 341, or Ger 342.

Ger 527 - The Age of Goethe (4)
Study of German poetry, drama, and prose fromthe Sturm und Drang and Clas sicismto the beginning of Romanticism.
Also offered for undergraduate-level credit as Ger 427 and may be taken only once for credit.

## Ger 528 - German Romanticism (4)

Study of the literature, art, and aesthetic theories of late 18th and 19th century Germany.
Also offered for undergraduate-level credit as Ger 428 and may be taken only once for credit. .

Ger 529 - German Realismand Naturalism (4)
Study of the poetry, drama, and proseof the second half of the 19th century.
Also offered for undergraduate-level credit as Ger 429 and may be taken only once for credit. .
Ger 533 - German Literature of the 20th Century (4)
Readings in modern poetry, drama, and prose. Ger 433/533: from the turn of the century to theend of World WarII; Ger 434/534: from the post-war years to the present. This is the first course in a sequence of two: Ger 533 and Ger 534.

Also offered for undergraduate-level credit as Ger 433 and may be taken only once for credit. .
Ger 534 -German Literature of the 20th Century (4)
Readings in modern poetry, drama, and prose. Ger 433/533: from the turn of the century to theend of World WarII; Ger 434/534: from the post-war years to the present. This is the second course in a sequence of two: Ger 533 and Ger 534.

Also offered for undergraduate-level credit as Ger 434 and may be taken only once for credit. .

## Ger 541 -Major Works in Translation (4)

Study of selections frommasterpieces of German literature in trans lation, such as Goethe, the Weimar period, German Intellectual History, Ancient Myth in German Literature. Readings, lectures, and discussions in English.

Also offered for undergraduate-levelcredit as Ger 441 and may be taken only once for credit. .

## Ger 542 - Medieval Works In Translation (4)

Study of texts fromthe German Middle Ages. Readings, lectures, and dis cussions in English. Recommended prerequisite: 4 credits of upper division literature.

## Ger 551 - German Poetry (4)

Study of German lyric poetry. Analy sis of formand content.

Ger 552 - German Drama (4)
Critical study of representative works of German drama.

## Ger 553 - German Prose (4)

Study of representative works of German prose fiction.

## Ger 554 - Middle High German (4)

Linguistic and literary study of representative Middle High German texts. Conducted in English, readings in German. Recommended prerequis ite: Ger 302.

## Ger 584 - German Stylistics (4)

A study of the stylistic aspects of fictional and nonfictional writings within the context of the cultural and philosophicalhistory of modern Germany.

Also offered for undergraduate-levelcredit as Ger 484 and may be taken only once for credit.
Ger 590 - History of the German Language (4)
A general historical survey showing the development of German grammar, word formation, vocabulary, and syntax with reference to the his tory of other Germanic languages. Conducted in English. Recommended prerequisite: Ger 302.

## Ger 594 - German Linguistics (4)

Introduction to the basic concepts in linguistics and their application to German. Review of sound system; focus on morphology and syntax. Conducted in English.
Also offered for undergraduate-levelcredit as Ger 494 and may be taken only once for credit. .

Ger 597 - Applied German Linguistics (4)
A practical application of linguistic method to modern German. Emphas is on contrastive analysis of German and English.
Also offered for undergraduate-level credit as Ger 497 and may be taken only once for credit. .

## Grk - Greek

The Ancient Greek language courses are currently inactive and the department is not planning offer themthis year.

## Grk 101 - First-Year Ancient Greek Term 1 (4)

An introduction to ancient Greek. The course will provide a survey of ancient Greek grammar and syntax, as well as vocabulary building and elementary readings. This is the first course in a sequenceof three: Grk 101, Grk 102, and Grk 103.

## Grk 102 - First-Year Ancient Greek Term 2 (4)

An introduction to ancient Greek. The course will provide a survey of ancient Greek grammar and syntax, as well as vocabulary building and elementary readings. This is the second course in a sequence of three: Grk 101, Grk 102, and Grk 103.

## Grk 103 - First-Year Ancient Greek Term3 (4)

An introduction to ancient Greek. The course will provide a survey of ancient Greek grammar and syntax, as well as vocabulary building and elementary readings. This is the third course in a sequence of three: Grk 101, Grk 102, and Grk 103.

## Grk 199 - Special Studies (1-8)

(Credit to be arranged.)

## Grk 201 - Second-Year Ancient Greek Term 1 (4)

Course provides a review of grammar in the context of selected readings from archaic and classical authors. This is the first course in a sequence of three: Grk 201, Grk 202, and Grk 203. Recommended prerequisite: Grk 103.

Grk 202 - Second-Year Ancient Greek Term 2 (4)
Course provides a review of grammar in the context of selected readings fromarchaic and classical authors. This is the second course in a sequence of three: Grk 201, Grk 202, and Grk 203. Recommended prerequisite: Grk 103.

## Grk 203 - Second-Year Ancient Greek Term 3 (4)

Course provides a review of grammar in the context of selected readings fromarchaic and classical authors. This is the third course in a sequence of three: Grk 201, Grk 202, and Grk 203. Recommended prerequisite: Grk 103.

## Grk 299 - Special Studies (1-12)

(Credit to be arranged.)

## Grk 330U- Ancient Epic: Glory and Memory (4)

Explores the Homeric epics, how they framed the values and limits of human achievement for the ancient Greeks, their influence on the development of other genres of Greek literature such as tragedy and comedy, and their enduring legacy in Roman literature. Conducted in English.

## Grk 332U-Gods and Mortals: Harnessing the Divine

 (4)A survey of how the ancient Greeks sought to procure divine aid for communal or private benefit through rituals and practices, such as prayers, sacrifices, mystery cults, and curse tablets, and the influence on later Roman religion. A full spectrumof practices will be considered, as revealed in literary, inscriptional, artistic, and archaeological evidence. Conducted in English.

## Grk 333U- Women in Ancient Greece (4)

Course on the role of women in ancient Greece as daughters, wives, concubines, mothers, heiresses, writers, priestesses, and participants in religious rituals and festivals. Conducted in English.

## Grk 335U- Tragedy, Fate, and Fragility (4)

A study of Greek tragedy and the underlying worldview of vulnerability, loss, and fraught choices often made under the yoke of necessity, primarily through the works of Sophocles and Euripides. Course will consider how the Greeks (and later Romans) articulated the fragility of human happiness, and the various strategies devised to cope with this seemingly unavoidable aspect of human existence. Conducted in English.

Grk 336U- Ancient Laughter: Ridicule and the Absurd (4)

A survey of ancient comedy, satire, invective, and epigram, primarily in Greek literature but also as appropriated and adapted by the Romans. The course considers the myriad mechanis ms by which laughter was elicited and the functions to which humor was put, along with the underlying cultural values in its varied contexts. Taught in English.

## Grk 399 - Special Studies (1-6)

(Credit to be arranged.)

GRN-Gender Race and Nations

## GRN 406 -Special Projects (1-12)

(Credit to be arranged.)

## GRN 410 - Special Studies (1-12)

(Credit to be arranged.)

## GRN 422 - Critical Perspectives on Quantitative

 Analysis (4)Uses critical Indigenous, decolonizing, feminist and antiracist lenses to evaluatequantitative research applications, including development of research questions; study designs; appropriate use of statistical and other quantitative methods; audience and dissemination of quantitative findings. Interdisciplinary and intersectional focus and applications. Note: Not a methods course; does not teach statistical or quantitative methods.

Also offered for graduate-level credit as GRN 522 and may be taken only once for credit. Prerequisite:Familiarity and experience with basic statistical and quantitative data and methods; permission of instructor required. Cross-Listed as: This is the same course as WS 422 and may be taken only once for credit.
GRN 502 - Independent Study (1-9)
(Credit to be arranged.)

## GRN 505 - Reading and Conference (1-9)

(Credit to be arranged.)

GRN 506 - Projects (1-9)
(Credit to be arranged.)

GRN 507 -Seminar (1-9)
(Credit to be arranged.)

## 509509 -Practicum(1-9)

(Credit to be arranged.)

## GRN 510 -SelectedStudies (1-9)

(Credit to be arranged.)

## GRN 515 - Constructions of Power and Knowledge: Gender, Race, and Nations (4)

Course critically analyzes how the concepts of gender, race, culture, class, sexuality, and nation are invested with power and inequality. Examines the politics of the production of knowledge in personal lived experiences; institutions; cultural, economic and geopolitical structures; and literary, visual and multimedia representations.

## GRN 520 - Critical and Decolonizing Research Methodologies (4)

This interdisciplinary and multidis ciplinary graduate course will provide an overview of critical and decolonizing research methodologies focused on relations of race, gender, nations, and sexuality, with attention to other dimensions of difference and power. Emphas is will be on novel approaches to research as an avenue for social justice.

## GRN 522 - Critical Perspectives on Quantitative Analysis (4)

Uses critical Indigenous, decolonizing, feminist and antiracist lenses to evaluatequantitative research applications, including development of research questions; study designs; appropriate use of statistical and other quantitative methods; audience and dissemination of quantitative findings. Interdisciplinary and intersectional focus and applications. Note: Not a methods course; does not teach statistical or quantitative methods.

Also offered for undergraduate-level credit as GRN422 and may be taken only once for credit. Prerequisite: Familiarity and experience with basic statistical and quantitative data and methods. Cross-Listed as: This is the same course as WS 522 and may be taken only once for credit.

## GRN 530 - Social Justice Pedagogy (4)

Focus on contemporary radical pedagogical theories and practices. Students will analyze, experience and develop their own social justice pedagogies. Students will examine radical theories of education and co-create practical strategies with the intention of building towards social transformation.

## GRN 550 -Seminar in Gender, Race, and Nations (4)

In-depth study of varying topics related to gender, race, and nations froman interdisciplinary and intersectional approach. Focus is on rethinking and challenging foundational western, heteropatriarchal, colonialist, heteronormative, and white supremacist way s of understanding the topical focus related to the reproduction and production of social relations, domination and resistance.

## GSCM - Global Supply Chain Management

## GSCM 310 - Introduction to Supply Chain Management of Food and Beverage Systems (4)

This survey course covers food and beverage supply chain management fromproduction of raw materials through to consumers. Food supply chain managers must address food safety, climate change, diminishing resources, stakeholder values, waste management, sourcing, logistics, and multiple operational changes. The course includes economic, social and environmental perspectives.

GSCM 401 - Research (1-12)
(Credit to be arranged.)

GSCM 402 - Independent Study (1-12)
(Credit to be arranged.)

GSCM 404 - Cooperative Education/Internship (1-6)
(Credit to be arranged.)

GSCM 406 - Special Projects (1-12)
(Credit to be arranged.)

## GSCM 410 -Selected Studies (1-8)

(Credit to be arranged.)

## GSCM 412 - Introduction to Enterprise Resource Planning Systems (4)

Introduction to andoverview of Enterprise Resource Planning (ERP) systems, their function in business, the major modules, and data structures with an emphasis on supply chain and accounting issues.
Prerequisite: BA 339.

## GSCM 429 - Global transportation and Logistics management (4)

Overview of global logistics including tran sportation, warehouse location and layout, inventory policies, distribution operations, information systems, and import tariffs.

Prerequisite: BA 339.

## GSCM 430 -Decision Making Using Enterprise Systems andData Analytics (4)

An introduction and overview to enterprise resource planning (ERP) systems, their function in business, some major transactions, and datas tructures that support managing a supply chain. Students will also gain experience with data analytics and visualization tools.
Prerequisite: BA 339 and BA 325; must be admitted into the school of business.

## GSCM 432 - Craft Beverage Operations Management (4)

An overview of the craft brewery business from grower to glass. Covers processes and associated costs for making and selling craft beverages from raw materials to production, distribution, and retail environments. Students will complete a basic business plan.
Also offered for graduate-level credit as GSCM 532 and GSCM 532 and may be taken only once for credit. Prerequisite: BA 339.

## GSCM 439 - Global Sourcing andNegotiation (4)

Deals with developing sound policies and procedures in managing the supply chain. Topics include supplier selection and evaluation, competitive bidding, contract development and administration, value analysis, and standardization. In addition, basic negotiation topics are covered.
Prerequisite: BA 339.

## GSCM 440 - Governmental Procurement (4)

Introduction to theories and practices of governmental procurement. Major aspects of purchasing within public
agencies in the United States with specialemphasis on the Oregon statutes and administrative rules. Differences between public and private purchasing processes. Federal purchasing processes.
Prerequisite: BA 339.

## GSCM 450 - Project Management (4)

Develops a basic understanding of principles and tools of project management. Covering the phases and activities of projects, as well as the management tools used to create project plans, management, including the impacts of organizational strategy, structure and culture on the development and execution of projects.
Prerequisite: BA 339.

## GSCM 451 - Business Forecasting (4)

Focuses on the use of various forecasting tools to aid in making managerial decisions. Examination of the various forecasting models and methods in a core activity. Understanding the abilities of the forecasting tools will be examined. Students will analyze data using many of the tools and assess andevaluate the validity of each.
Prerequisite: BA 339.
GSCM 454 - Supply and Logistics Negotiations (4)
This course covers global supply chain topics including risk management, collaboration, strategy development and sustainability.
Prerequisite: GSCM 429 or GSCM 439.

## GSCM 458 - Purchasing and Logistics within the Food Industry (4)

Explores the rapid transition of food industry operations through an in-depth look at food commodity production, processing, storage, and transportation; facility location and transportation network design; role of wholes alers and distributors in the food supply chain; food safety; food industry consolidation and globalization; supply chain compression; ECR and demand forecasting; andecommerce and the food industry.

Also offered for graduate-level credit as GSCM 558 and GSCM 558S and may be taken only once for credit. . Prerequisite: BA 339.

## GSCM 459 - Production Planning and Control (4)

Intermediate and short range production planning and scheduling. Topics will include aggregate planning, materials requirement planning, scheduling and just-intime.
Also offered for graduate-level credit as GSCM 559 and GSCM 559S and may be taken only once for credit. . Prerequisite: BA 339.

## GSCM 469 - Lean Management (4)

This course covers the foundation and the basic principles of lean and lean thinking to improve an organization's performance by eliminating waste. Students will learn the concepts and the tools of Lean which include 5S, Standard work, TPM, Kanban, Poka Yoke, SMED, Value Stream Mapping.

Also offered for graduate-level credit as GSCM 569 and may be taken only once for credit. Prerequisite: BA 339.

## GSCM 479 - Global Supply Chain Strategy and Sustainability Management (4)

This course covers global supply chain topics including risk management, collaboration, strategy development and sustainability.

Prerequisite: GSCM 429 and GSCM 439.
GSCM 501 -Research (1-9)
(Credit to be arranged.)

GSCM 502 - Independent Study (1-9)
(Credit to be arranged.)

## GSCM 504 - Cooperative Education/Internship (1-9)

(Credit to be arranged.)

## GSCM 505 - Reading \& Conference (1-12)

(Credit to be arranged.)

## GSCM 506 -Special Projects (1-9)

(Credit to be arranged.)

## GSCM 507 -Seminar (1-6)

(Credit to be arranged.)

## GSCM 509 - Practicum(1-9)

(Credit to be arranged.)

## GSCM 510 -Special Topics (1-8)

(Credit to be arranged.)

## GSCM 511 - Principles of Strategic Global Sourcing (4)

Overview of planning strategies and tactical execution for sustainable operational sourcing in a global environment. Topics to be reviewed include; locating and qualifying international suppliers, the strategies regarding outsourcing / off-shoring, supplier operational metrics and strategies, establishing and maintaining relationships, e-procurement, new product introduction, and quality systems with selected suppliers.

## GSCM 512 - Global Managerial and Cost Accounting

 (4)The coursecovers global managerial costaccounting is sues, and focuses on the use of accounting information within the multinational firm. In addition, the course will consider financial models used in analyzing the economic viability of new products and services. Students will also be exposed to activity based costing, standards and variance analysis, and inventory valuation.

## GSCM 513 - Principles of Strategic Global Logistics (4)

This course deals with the development of strategies supply chain management involving the transfer of goods and services across national boundaries. Included are studies of inventory and warehouse planning and control and the principles of transportation. Managing logistics in an international environment will be the primary focus, with special attention given to air, rail, truck, and sea trans portation.

## GSCM 514 - Reverse Logistics andClosedLoop Supply Chain (4)

The increas ing globalization of suppliers and customers has increased concern with the is sues of sustainable and responsible management across global supply chains. In this course students will explore the main risks, opportunities and practices we now see in global supply chain management fromboth conceptual and practical perspectives on sustainable practice. Students in this course will engage in applied studies and learn from academics and practitioners about the current challenges in this criticalbusiness arena.

## GSCM 515 - Global Case Studies in Supply Chain Management (4)

The final coursein the Supply and Logistics Specialization integrates all of the concepts contained within the previous three clas ses. Global Supply and Logistics planning and strategy development is the primary focus. This is a case study based course where each week students are expected
to analyze and prepare supply and logistics cases in an international setting. Emphasis is on developing analytical and problem-solving skills and generating the quantitative and qualitative information necessary to make superior managerialdecisions.

## GSCM 516 - Global Supply Chain Forecasting and Production Planning (4)

The objective of this course is to familiarize students with the major tools used for manufacturing planning and control. To this end, we will perform an in-depth analysis of integrated operations management systems with emphasis on operations planning and control, material requirements planning, master scheduling, forecasting, capacity planning, just-in-time and related topics. These tools will be covered with more detail than previous SCM courses and we will examine how the various components fit together to form a complete system.

## GSCM 517 -Supply Chain International Field Study

 (4)Economic globalization can provide enormous strategic benefits (risks) by coordinating operations located in different countries. Today's producers mustcoordinate international material flow, produce in multiple countries, and deliver new products to customers at ever increasing speed and on-time. This course will provide students with an "on the ground" opportunity to explore the challenges in globalized operations strategies.

## GSCM 518 - Global Supply Chain Project Management

 (4)This course emphasizes how to implement a project within the time, cost, scope, and quality success criteria that influence supply chain strategies. The spectrum of project management in supply chain includes the participation in new product development, sourcing of supply, the transformation process, logistics, and planning for the return of materials after the life cycle is complete.

## GSCM 519 - Global Supply Chain Negotiations (4)

The purpose of this course is to analyze the negotiation challenges faced by the global supply chain professional. Thus the content is focused on contract negotiation, Uniform Commercial Code, UN Convention on Contracts, and e-procurement. The course will encourage development of these skills experientially by emphasizing relationships and a total cost perspective.

## GSCM 520 - Global Supply Chain Strategy (2)

In this course students develop the ability to conceptualize, design, and implement supply chains aligned with product, market, and customer characteristics. Students assess how internet technologies, dy namic markets, and globalization are impacting supply chain strategies and practices, including: logistics, inventory and risk management, procurement and supply contracting, product and process design, and revenue channels.

## GSCM 521 - Global Information, Systems andData Analytics (4)

The premise of this course is that supply chain management mustunderstand and assess the information resources and technologies that underpin the life cycle of goods and services. Information is generated at each stage of the supply chain and crucial to the performance is where and how to store, analyze and actupon its insights.

## GSCM 522 - Global Leadership and Ethics in Supply Chain Management (2)

This course provides students with a solid understanding of the concepts linking leadership to global and social systems, international organizational development, and the connection between leadership, systems, and global supply chains Global leadership is studied fromfour perspectives: the virtualteamleading across borders and organizations, ethical and cultural ramifications of leadership, and the ethical traits of global leaders and followership, and your own value systemand its place within a global supply chain organization.

## GSCM 525 - Supply Chain Caps tone Consulting Experience (4)

The course provides students the opportunity to have a significant, hands-on experience that builds upon the foundation of the core of the GSCM program. Students, operating as part of a consulting team, work closely with a client to help to solve a supply chain oriented business problem. The scope of the project is 600 hours of research as a group on the behalf of the client.

## GSCM 532 - Craft Beverage Operations Management (4)

An overview of the craft brewery business from grower to glass. Covers processes and associated costs for making and selling craft beverages fromraw materials to production, distribution, and retail environments. Students will complete a basic business plan.

Also offered for undergraduate-level credits as GSCM 432 and may be taken only once for credit. . Cross-Listed as: This is the same course as GSCM 532S and may be taken only once for credit. .

## GSCM 532S - Craft Beverage Operations Management (4)

An overview of the craft brewery business from grower to glass. Covers processes and associated costs for making and selling craft beverages fromraw materials to production, dis tribution, and retail environments. Students will complete a basic business plan

Also offered for undergraduate-level credit as GSCM 432 and may be taken only once for credit. . Prerequisite: BA 339. Cross-Listedas: This is the same course as GSCM 532 and may be taken only once for credit. .

## GSCM 558 -Purchasing and Logistics within the Food

 Industry (4)Explores the rapid transition of food industry operations through an in-depth look at food commodity production, processing, storage, and transportation; facility location and transportation network design; role of wholes alers and dis tributors in the food supply chain; food safety; food industry consolidation and globalization; supply chain compression; ECR and demand forecasting; andecommerce and the food industry.
Also offered for undergraduate-level credit as GSCM 458 and may be taken only once for credit. . Cross-Listed as: This is the same course as GSCM 558S and may be taken only once for credit.

## GSCM 558S - Purchasing and Logistics within the Food Industry (4)

Explores the rapid transition of food industry operations through an in-depth look at food commodity production, processing, storage, and transportation; facility location and transportation network design; role of wholes alers and dis tributors in the food supply chain; food safety; food industry consolidation and globalization; supply chain compression; ECR and demand forecasting; andecommerce and the food industry.
Also offered for undergraduate-level credit as GSCM 458 and may be taken only once for credit. . Prerequis ite: BA 339. Cross-Listed as: This is the same course as GSCM 558 and may only be taken once for credit.

## GSCM 559 - Production Planning and Control (4)

Intermediate and short range production planning and scheduling. Topics will include aggregate planning, materials requirement planning, scheduling and just-intime.
Also offered for undergraduate-level credit as GSCM 459 and may be taken only once for credit. . Cross-Listed as:

This is the same course as GSCM 559S and may be taken only once for credit. .

## GSCM 559S - Production Planning and Control (4)

Intermediate and short range production planning and scheduling. Topics will include aggregate planning, materials requirement planning, scheduling andjust-intime.
Also offered for undergraduate-level credit as GSCM 459 and may be taken only once forcredit. . Prerequisite: BA 339. Cross-Listed as: This is the same course as GSCM 559 and may be taken only once for credit.

## GSCM 560 -Supply Chain Modeling \& Simulation (4)

Introduces a variety of modeling and simulation techniques and can be used toexplore a number of topics in supply chain management.

Prerequisite: Admis sion into the program.
GSCM 569 - Lean Management (4)
This course covers the foundation and the basic principles of lean and lean thinking to improve an organization's performance by eliminating waste. Students will learn the concepts and the tools of Lean which include 5S, Standard work, TPM, Kanban, Poka Yoke, SMED, Value Stream Mapping.
Also offered for undergraduate-level credit as GSCM 469 and may be taken only once for credit. Cross-Listed as: This is the same course as GSCM 569S and may be taken only once for credit.

## GSCM 569S - Lean Management (4)

This course covers the foundation and the basic principles of lean and lean thinking to improve an organization's performance by eliminating waste. Students will learn the concepts and the tools of Lean which include 5S, Standard work, TPM, Kanban, Poka Yoke, SMED, Value Stream Mapping.
Also offered for undergraduate-level credit as GSCM 469 and may be taken only once for credit. Prerequis ite: BA 339. Cross-Listed as: This is the same course as GSCM 569 and may be taken only once for credit.

## GSCM 571 - Business Analytics I(4)

Introduce students to key analytics methods dealing with statistics, probability, and forecasting.
Prerequisite: Admitted into the program.
GSCM 572 - Business Analytics II (4)
Focus on the use of mathematical programming and optimization methods to support decision-making related to supply chain management.
Prerequisite: Admis sion into the program.

## GSCM 573 -New Product Introduction and Innovation (4)

Apply supply chain management thinking into new product design and innovation process.
Prerequisite: Admission into the program.
GSCM 575 -Machine Learning in Business (4)
Machine learning applies a computer algorithmto detect patterns from which it "learns" the relationships among a set of variables to generate predictions for a variable of interest, assesses the predictive accuracy of its outputs, and then modifies itself accordingly to improve the accuracy of future predictions. The profound effects of machine learning contribute not only to business analysis, but increas ingly influence society as a whole such as Netflix recommendations, medical diagnostics, facial recognition on photographs stored on a smartphone, and self-driving cars.

## Heb - Hebrew

## Heb 101 - First-Year Modern Hebrew Term 1 (4)

Introduction to modern Hebrew; emphasis on basic grammar, syntax, noun and verb formation, listening and reading comprehension, translation, writing, and speaking. For nonnative speakers of Hebrew only. This is the first course in a sequence of three: Heb 101, Heb 102, Heb 103.

## Heb 102 - First-Year Modern Hebrew Term 2 (4)

Introduction to modern Hebrew; emphasis on basic grammar, syntax, noun and verb formation, listening and reading comprehension, translation, writing, and speaking. For nonnative speakers of Hebrew only. This is the second course in a sequence of three: Heb 101, Heb 102, Heb 103.

## Heb 103 - First-Year Modern Hebrew Term 3 (4)

Introduction to modern Hebrew; emphasis on basic grammar, syntax, noun and verb formation, listening and reading comprehension, translation, writing, and speaking. For nonnative speakers of Hebrew only. This is the third course in a sequence of three: Heb 101, Heb 102, Heb 103.

## Heb 199-Special Studies (1-3)

(Credit to be arranged.)

Heb 201 - Second-Year Modern Hebrew Term 1 (4)
Continued study of grammar and syntax, reading intermediate literary texts, translation, conversation, writing, and speaking. Recommended prerequisite: Heb 103. For non-native speakers of Hebrew only. This is the first course in a sequence of three: Heb 201, Heb 202, Heb 203.

Heb 202 - Second-Year Modern Hebrew Term 2 (4)
Continued study of grammar and syntax, reading intermediate literary texts, translation, conversation, writing, and speaking. Recommended prerequisite: Heb 103. For non-native speakers of Hebrew only. This is the second course in a sequence of three: $\mathrm{Heb} 201, \mathrm{Heb} 202$, Heb 203.

Heb 203 - Second-Year Modern Hebrew Term 3 (4)
Continued study of grammar and syntax, reading intermediate literary texts, translation, conversation, writing, and speaking. Recommended prerequisite: Heb 103. For non-native speakers of Hebrew only. This is the third course in a sequence of three: Heb 201, Heb 202, Heb 203.

Heb 299-Special Studies (1-12)
(Credit to be arranged.)

## Heb 301 - Third-Year Modern Hebrew Term 1 (4)

301 emphasizes essays, short stories, and selected poems.
302 emphas izes modern media Hebrew. Translation and writing. Recommended prerequisite: Heb 203. For nonnative speakers of Hebrew only. This is the first course in a sequence of two: Heb 301, Heb 302.

Heb 302 - Third-Year Modern Hebrew Term 2 (4)
301 emphasizes essays, short stories, and selected poems. 302 emphasizes modern media Hebrew. Translation and writing. Recommended prerequisite: Heb 203. For nonnative speakers of Hebrew only. This is the second course in a sequence of two: Heb 301, Heb 302.

Heb 303 - Third-Year Modern Hebrew Term 3 (4)
Intermediate to advanced Modern Hebrew. Intensive grammar review and listening comprehension. Extensive oral and written practice.
Prerequisite: Heb 302.

## Heb 344 - Israel through Graphic Novels (4)

Discusses central themes in contemporary Israel as they are represented in Is raeli graphic novels and graphic novels written about Israel in the 2000s and 2010s.

## Heb 361 - Israel through Film (4)

Discusses the history and culture of Israel as it is represented in Israeli cinema from 1931 up through the 2010s.

## Heb 399 - Special Studies (1-6)

(Credit to be arranged.)

## Heb 401 - Research(1-6)

(Credit to be arranged.)

## Heb 404 - Cooperative Education/Internship (1-12)

(Credit to be arranged.)

## Heb 410 - Selected Topics (1-6)

(Credit to be arranged.)

## Hon - University Honors Program

## Hon 101 - The Global City (5)

This year-long sequence introduces ways to think critically about the urban environment and the interdependence between the city and the global world. It begins the study of representations and perceptions of the city, the city in historical context, and the processes that shape the city's geopolitical manifestations. This is the first course in a sequence of three: Hon 101, Hon 102, and Hon 103.
Prerequisite: admission to Honors Program.

## Hon 102 - The Global City (5)

This year-long sequence introduces ways to think critically about the urban environment and the interdependence between the city and the global world. It begins thestudy of representations and perceptions of the city, the city in historical context, and the processes that shape the city's geopolitical manifestations. This is the second course in a sequence of three: Hon 101, Hon 102, and Hon 103.

Prerequisite: admission to Honors Program.

## Hon 103 - The Global City (5)

This year-long sequence introduces ways to think critically about the urban environment and the interdependence between the city and the global world. It begins the study of representations and perceptions of the city, the city in historical context, and the processes that shape the city's geopolitical manifestations. This is the third course in a sequence of three:Hon 101, Hon 102, and Hon 103.
Prerequisite: admis sion to Honors Program.

## Hon 199 - Studies I-VI (1-6)

Studies I-III comprise 15 credits ( 12 hours lecture, 3 hours recitation): Studies IV-VI comprise 12 credits (lecture only, no recitation).

## Hon 201 - Urban Social Systems: Methods in the Social Sciences (4)

In tandemwith Hon 202 and Hon 203, this course emphasizes undergraduate research, with the city of Portland serving as archive, stage, and laboratory. Students explore the concepts and systems by which cities operate through the application of primarily qualitative social science methodologies, such as ethnography and spatial/geographic analysis.

Prerequis ite: admis sion to Honors Program.
Hon 202 - Reading Urban Cultural Systems: Methods in the Humanities (4)

In tandemwith Hon 201 and Hon 203 this course examines the urban surround, this time through the lens of the humanities, by careful examination of artifacts, texts, and cultural institutions.

Prerequisite: admis sion to Honors Program.
Hon 203 - Urban Ecological Systems: Methods in the Sciences (4)

In tandemwith Hon 201 and Hon 202, this course emphasizes undergraduateresearch, with the city of Portland serving as archive, stage, and laboratory. Students explore the concepts and ecological systems by which cities operate through the application of primarily quantitative science methodologies.
Prerequisite: admis sion to Honors Program.

## Hon 299 - Special Studies (1-12)

(Credit to be arranged.)

## Hon 360 - Honors Writing for Transfer Students (4)

Honors Writing for Transfer Students is the required entry point for transfer students entering the Honors College at the junior level. This course introduces transfer students to
ways of thinking about the urban experience, introduces and develops the basic writing and research tools necessary for upper-level seminar work in Honors and for the senior thesis, and provides working examples of disciplinary scholarship. This is a writing intensive course and fulfills 4 credits of the third year requirement for transfer students. Class size limited to 24.

Prerequisite: Transfer students entering the Honors College at the junior level.

## Hon 399 - Special Studies (1-4)

(Credit to be arranged.)

## Hon 401 - Research (0-15)

(Credit to be arranged.)

## Hon 403 - Thesis (1-12)

(Credit to be arranged.)

Hon 404 - Cooperative ed/Internship(1-12)
(Credit to be arranged.)

## Hon 405 - Reading and Conference (0-12)

(Credit to be arranged.)

## Hon 407 -Seminar (1-6)

Consent of instructor. Reading and discussion of an area to be chosen by instructor, with a seminar paper required.

## Hon 410 -SelectedStudies (1-6)

(Credit to be arranged.)

## HSMP - Health Systems Management and Policy

HSMP 502 - Independent Study (1-12)
(Credit to be arranged.)

HSMP 504 - Cooperative Ed/Internship (1-9)
(Credit to be arranged.)

HSMP 505 - Reading and Conference (1-9)
(Credit to be arranged.)

HSMP 507 -Seminar (1-9)
(Credit to be arranged.)

## HSMP 509-Practicum (1-9)

(Credit to be arranged.)

## HSMP 510 - SelectedStudies (1-6)

(Credit to be arranged.)

HSMP 541 - Organizational Behavior in Health Service
Organizations (3) Organizations (3)

This course provides an overview of organizational theory and behavior in health services organizations. The emphas is is on developing an understanding of the factors and forces that influence the structures, behaviors and operations of various organizations that deliver health and related services. This understanding will be developed through consideration of org anizations, their en vironments, and the roles of individuals working in management.

## HSMP 542 - Marketing in Health Services Organizations (3)

This course provides students with concrete tools and knowledge about marketing concepts and processes in health services and develops competencies for application of marketing principles for a range of health services organizations. Concepts of mes saging are als o addressed as a component of the marketing strategy.

## HSMP 543 - Culture and Health Care (3)

The course is designed to provide an examination of health delivery and outcomes and the influence of culture. Using readings in conjunction with interactive learning, students consider various cultures and their interactions with the health care system. Knowledge of the tools, techniques, and applications of cultural assessment and cultural competency will be achieved. This course is open to admitted students in the graduate programs in the Division of Public Adminis tration and other appropriate graduate programs. This is the same course as PAH 543 and may be taken only once for credit.
Cross-Listed as: PAH 543.

## HSMP 544 -Leadership and Governance in Health Services (3)

Class explores principles and practices of leadership and governance in a variety of health and human services organizations. Theories of leadership and models of governance are studied, and explored through case studies of localhealth and human services leaders and their governance relationships. Students als o conduct selfassessments of present and future leadership practice and potential.

Prerequisite: HSMP 541, HSMP 571, and HSMP 574.

## HSMP 570 - Health Administration (3)

An examination of is sues related to the administration of health care systems. Topics include: changing patterns of health care, budget and financial management techniques, and political influences on health adminis tration. This is the same course as PAH570 and may be taken only once for credit.

## Cross-Listed as: PAH 570.

## HSMP 571 - Health Policy (3)

Centers on an investigation of the public policy process as it affects the health care field. Specific health care policies and programs are used to explore the characteristics of the health care policy process and the factors involved in the formulation, implementation, and evaluation of health care policies and programs. Recommended corequisite: HSMP 574.

Also offered as HSMP 671 and may be taken only once for credit.

## HSMP 572 - Health Politics (3)

This course is designed to survey the inter-workings of health care legislation. By examining the nuts and bolts of health law development, a better understanding of health policy development within the context of the political systemcan be realized. Health legislation is examined in terms of historical analysis and the leg is lative process, including the role of interest groups, the use of information in the political system, the role of bureaucracy, and the budget process. Recommended corequisite: HSMP 574.

## HSMP 573 - Values and Ethics in Health (3)

This course addresses is sues and questions regarding values and ethics in health, with particular attention to public health practice and health policy and management. It provides students with opportunities to consider issues in health and social services that challenge values and pose ethical issues, and assists students in addressing these is sues in the context of both personal and organizational values and beliefs. Specific course content includes, but is not limited to, ethical is sues such as reproductive issues,
emerging diseases, product liability, pharmaceutical controls, advertising, occupational and environmental is sues, and research dilemmas.
Also offered as HSMP 673 and may be taken only once for credit. Prerequisite: Completion of at least 30 credits of the graduate program.

## HSMP 574 - Health Systems Organization (3)

This course introduces basic concepts and is sues in the organization, financing, and delivery of health services. The emphasis is on the systemic as pects of health services production and delivery which address the health needs of populations with respect to death, disease, disability, discomfort, and dissatisfaction. Students will examine the inter-relationships of sy stemstructures, subsystems, and processes, as well as their interactions with the larger social, cultural, economic and political environments in which they exist. The focus is on the United States, with international comparisons used toillustrate similarities and differences.

Also offered as HSMP 674 and may be taken only once for credit.

## HSMP 575 - Advanced Health Policy (3)

This course enables students to deepen their understanding of local, regional, national and international health policies and policy is sues with specific reference to the underlying dynamics of the policy process. Understanding the process and nature of policy choices will be emphasized - who, what, how and why of explicit and implicit decisions and choices that lead to the ultimate policy. Students will develop an understanding of how health policy can be successfully developed and sustainably implemented.
Also offered as HSMP 675 and may be taken only once for credit. Prerequis ite: HSMP 571.

## HSMP 576 - Strategic Management of Health Care Organizations (3)

This course enables students to define health services delivery problems and issues, collect and analyze relevant information, and articulate solutions to strategic management issues. Course content emphasizes org anizational strategic planning tools and processes, including directional strategies, internal and external environmental as sessments, strategy formulation, implementation, and evaluation. Students will demons trate ability to integrate knowledge and skills developed across the curriculumby conducting focused case analyses and a situational assessment of a health organization.
Prerequis ite: HSMP 541, HSMP 574, HSMP 587, HSMP
588 and completion of at least 30 credit hours in the MPH:HMP orMPA:HA programof study.

## HSMP 577 - Health Care Law and Regulation (3)

Course intended to be an introduction to the American legal systemand the laws that affect public health and health care. Initially, course focuses on public legal relationships between governments and individuals, and proceeds to review private legal relationships between individuals or organizations. Reviews the source of laws affecting health care, the basics of constitutional law, the right to privacy, state and federal regulation of health care, and negligence in health care. Wraps up with an introduction to cutting edge health care is sues such as health care fraud and abuse compliance and medical record privacy.
Also offered as HSMP 677 and may be taken only once for credit. Prerequisite: HSMP 571, HSMP 574.

## HSMP 578 - Performance Improvement in Health Services (3)

This course introduces students to organizational performance improvement and illustrates applications in health services delivery. Course content draws upon literature regarding industrial quality improvement, org anizational performance assessment, patient safety, and health services improvement. Students will learn to apply improvement science to redesign systems and processes to achieve performance improvement in various kinds of health services delivery organizations. Students will apply this knowledge to personal, organizational and systems level improvement projects.

Prerequisite: HSMP 541, HSMP 574.

## HSMP 579 - Health Information Technology and Systems Management (3)

Advances in information technology are driving fundamental changes throughout health care and transforming the health care industry. Students will gain an understanding how to manage and use health information technology s ystems. The course will identify the various types of health care information systems, and assess the key is sues confronting the management of such systems, including business needs, the relationship between org anizational needs and technology capabilities, and the management and control of IT resources in a variety of health-related organizational settings.
Prerequisite: HSMP 574.

## HSMP 580 - Health Services Human Res ources Management (3)

Overview of human res ources within the context of health care organizations. Focus on the practical application of human resources management principles in the work setting through discussion of situations common in health care environments. Elements of the situation ev aluated from the health care employee and health care manager
pers pectives. Examples of techniques, forms, and tools will be discussed.

Prerequisite: HSMP 574, HSMP 541.

## HSMP 581 - Population Health: Policy and Practice Implications (3)

Introduction to concepts of population health as they relate to policy and practice. In addition to exploring various meanings of the term"population health", the course considers three primary drivers of population health: longterm demographic trends (e.g., population aging, immigration, fertility); social and economic policies (including health policy); and characteristics of the healthcare system. Special emphas is is placed on trans lating knowledge into effective policies and practice to address population health.

Also offered as HSMP 681 and may be taken only once for credit.

## HSMP 582 - Oregon Heal th Policy: Lessons for State and National Health Reform (3)

Reviews Oregon's nationally recognized health reforms and examine the lessons learned for the development and implementation of health policy at the national, state and local levels. Fundamental to the course will be exploring the many is sues around employing public policy to address problems around access, cost, financing and quality in health care. This will be a seminar style course with an opportunity for students to meet with and learn from experts. Expected preparation: HSMP 571 Health Policy.

Also offered as HSMP 682 for doctoral students.

## HSMP 583 - Economics of Health Systems \& Policy (3)

Health policy has a fundamental transactional nature. Economics provides a broad theoretical framework that seeks to assess and understand transactional relationships. Thus, economics has particular value as a means to diagnose the transactional problems that underpin health systemdynamics and provide frameworks for proposed solutions. This course applies economic theory to assess problems in health systems and propose solutions, as well as critique existing policy and develop sound policy alternatives.

Also offered as HSMP 683 for doctoral students. Prerequisite: Successful completion of HSMP 586 with an earned "B-" minimum passing grade.

## HSMP 584 - Social Policy and Public Health (3)

Examines how social policies influence health, with particular attention to health equity and dis parities. Students will develop skills necessary to assess the empirical evidence for, and health implications of social policies in the areas of education, agriculture/nutrition, social welfare/income transfer, employment/labor,
housing/built environment, transportation, civil rights, and other policy domains.

Also offered for graduate-level credit as HSMP 684 and may be taken only once for credit.

## HSMP 585 - Implementation Science in Health Systems (3)

Students are introduced to the practice of implementation science as a strategic means toimprove implementation efforts and as a foundation for designing research to further that end. Common implementation science frameworks, models and strateg ies are introduced and assessed for their implications for action or measurement at the policy, system, organization and community level. This course is an elective for the Health Management and Policy (HMP) program.

Also offered for doctoral-level credit as HSMP 685 and may only be taken once for credit.

## HSMP 586 - Introduction to Health Economics (3)

Focuses on defining and meas uring the performance of the health care sector, defining and explaining microeconomic concepts, andevaluating various policy initiatives to improve efficiency, equity, and technological progress in health care. Specific topics include description of the health care industry, production of health, measurement of health care price changes, theory of demand for he alth care, theory of production and cost, meas urement of inputs and outputs, cost-benefit and cost-effectiveness analysis, and structure and functioning of markets. In addition, the role of government in a private economy in dealing with market failure is discussed, especially as it relates to the goal of ass uring universal access to health care. Does not require any specific preparation in economics or mathematics, although graphical presentation of economic concepts is emphasized. Recommended corequisite: HSMP 574.

Also offered as HSMP 686 and may be taken only once for credit.

## HSMP 587 - Financial Management of Health Services (3)

Focuses on the analysis and adminis tration of resources in the health care field. Among the specific topics included in this course are financial statements, budgeting, cash flow, costing, capital decision making, sources of capital and operating funds, depreciation and government reimbursement schemes, and human res ources planning and management.
Prerequisite: HSMP 574. Recommended corequisite: HSMP 586.

## HSMP 588 - Program Evaluation and Management In Health Services (3)

Introduces the theory and practice of programevaluation in the health services system. Includes multiple methods and uses of evaluation from the perspectives of managers, health professionals, and health services res earchers, with an emphasis on the utilization of evaluation findings in programplanning and management in health services. Course learning will be synthesized through a communitybased learning experience involving working with a community partner to develop an evaluation framework and methodology for an existing or proposed health program.

## HSMP 589 - Research Design in Health Services (3)

Provides an introduction to traditional methods of designing and conducting health services research. It is intended that at the completion of the course students will understand multiple approaches to health services research, be able to be both participants in and consumers of the research process, and will be competent in conducting critical apprais als of the health services literature and in writing research proposals.

Also offered as HSMP 689 and may be taken only once for credit. Prerequis ite: Bsta 525.

## HSMP 590 - Global Health ProgramEvaluation \& Management (3)

Programevaluation is a field of study and practice that is applicable across areas and disciplines. This course provides students with the theoretical and practical bases for the trans-discipline of programevaluation. The course emphasizes evaluation in the context of global health programs. Students will develop basic skills in a variety of approaches to evaluation, including techniques that are particularly suitable for evaluating global health programs.

## HSMP 603 - Dissertation (1-9)

Credits to be arranged.

## HSMP 605 - Reading and Conference (1-9)

(Credit to be arranged.)

## HSMP 607 - Doctoral Seminar in Health Systems and Policy (1-9)

Doctoral seminar in health systems and policy.

## HSMP 610 -SelectedStudies (1-9)

(Credit to be arranged.)

## HSMP 642-Organizational Theory and Health Systems (3)

Students in this course will develop an understanding of the organizational theory domain and enhance their ability to frame research within that domain in the context of health systems. The course emphasizes both substance and skill development, drawing on insights fromthe fields of economics, anthropology, political science and systems science to explore the structure and functions of org anizations, the interaction of org anizations and their environment, and the behavior of individuals within org anizations. Understanding organizational theory, research, actions and outcomes is fundamental.

## HSMP 660 - Contemporary Research in Health Systems andPolicy (3)

Doctoral seminar covering current topics in health systems and policy research providing doctoral students in the Health Systems and Policy Ph.D. programan opportunity to develop multi-dis ciplinary perspectives on current issues in their area of research.

## HSMP 671 - Health Policy (3)

Centers on an investigation of the public policy process as it affects the health care field. Specific health care policies and programs are used to explore the characteris tics of the health care policy process and the factors involved in the formulation, implementation, and evaluation of health care policies and programs. Recommended corequisite: HSMP 574.

Also offered as HSMP 571 and may be taken only once for credit.

## HSMP 673 - Values and Ethics in Health (3)

This course addresses is sues and questions reg arding values andethics in health, with particular attention to public health practice and health policy and management. It provides students with opportunities to consider issues in health and social services that challenge values and pose ethical issues, and assists students in addressing these is sues in the context of both personal and organizational values and beliefs. Specific course content includes, but is not limited to, ethical is sues such as reproductive issues, emerging diseases, product liability, pharmaceutical controls, advertising, occupational and environmental is sues, and res earch dilemmas.

## HSMP 674 - Health Systems Organization (3)

This course introduces basic concepts and is sues in the org anization, financing, and delivery of health services. The emphas is is on the systemic as pects of health services production and delivery which address the health needs of populations with respect to death, disease, disability, discomfort, and dissatisfaction. Students will examine the inter-relationships of sy stem structures, subsystems, and processes, as well as their interactions with the larger social, cultural, economic and political environments in which they exist. The focus is on the United States, with international comparisons used to illus trate similarities and differences.
Also offered as HSMP 574 and may be taken only once for credit.

## HSMP 675 - Advanced Health Policy (3)

This course enables students to deepen their understanding of local, regional, national and internationalhealth policies and policy issues with specific reference to the underlying dynamics of the policy process. Understanding the process and nature of policy choices will be emphasized - who, what, how and why of explicit and implicit decisions and choices that lead to the ultimate policy. Students will develop an understanding of how health policy can be successfully developed and sustainably implemented.
Also offered for graduate-level credit as HSMP 575 and may be taken only once for credit. Prerequisite: Completion of HSMP 571 orHSMP 671 or equivalent.

## HSMP 677 - Health Care Law and Regulation (3)

Course intended to bean introduction to the American legal systemand the laws that affect public health and health care. Initially, course focuses on public legal relationships between governments and individuals, and proceeds to review private legal relationships between individuals or organizations. Reviews the source of laws affecting health care, the basics of constitutional law, the right to privacy, state and federal regulation of health care, and negligence in health care. Wraps up with an introduction to cutting edge health care is sues such as health care fraud and abuse compliance and medical record privacy.
Also offered as HSMP 577 and may be taken only once for credit. Prerequis ite: HSMP 571, HSMP 574.

## HSMP 681 - Population Health: Policy and Practice Implications (3)

Introduction to concepts of population health as they related to policy and practice. In addition to exploring various meanings of the term"population health", the course considers three primary drivers of population health: long-termdemographic trends (e.g., population aging, immigration, fertility); social and economic policies (including health policy); and characteristics of the
healthcaresystem. Special emphas is is placed on trans lating knowledge into effective policies and practice to address population health.
Also offered for graduate-level credit as HSMP 581 and may be taken only once for credit.

## HSMP 682 - Oregon Health Policy: Lessons for State and National Health Reform (3)

Reviews Oregon's nationally recognized health reforms and examine the les sons learned for the development and implementation of health policy at the national, state and local levels. Fundamental to the course will be exploring the many issues aroundemploying public policy to address problems around access, cost, financing and quality in health care. This will be a seminar style course with an opportunity for students to meet with and learn from experts. Expected preparation: HSMP 671 Health Policy.
Also offered for graduate-level credit as HSMP 582.

## HSMP 683 - Economics of Health Systems \& Policy (3)

Health policy has a fundamental transactional nature. Economics provides a broad theoretical frame work that seeks to assess and understand transactional relationships. Thus, economics has particular value as a means to diagnose the transactional problems that underpin health systemdynamics and provide frameworks for proposed solutions. This course applies economic theory to assess problems in health systems and propose solutions, as well as critique existing policy and develop sound policy alternatives.
Also offered for graduate-level credit as HSMP 583.

## HSMP 684 -Social Policy and Public Health (3)

Examines how social policies influence health, with particular attention to health equity and disparities. Students will develop skills necessary to assess the empirical evidence for, and health implications of social policies in the areas of education, agriculture/nutrition, social welfare/income transfer, employment/labor, housing/built environment, transportation, civil rights, and other policy domains.
Also offered for graduate-level credit as HSMP 584 and may be taken only once for credit.

## HSMP 685 - Implementation Science in Health Systems

 (3)Students are introduced to the practice of implementation science as a strategic means to improve implementation efforts and as a foundation for designing research to further that end. Common implementation science frameworks, models and strategies are introduced and assessed for their implications for action or measurement at the policy, system, organization and community level. This course is an elective for the Health Systems and Policy doctoral program.

Also offered for master's-levelcredit as HSMP 585 and may be only taken once for credit.

## HSMP 686 - Introduction to Health Economics (3)

Focuses on defining and measuring the performance of the health care sector, defining and explaining microeconomic concepts, and evaluating various policy initiatives to improve efficiency, equity, and technological progress in health care. Specific topics include description of the health care industry, production of health, meas urement of health care price changes, theory of demand for health care, theory of production and cost, meas urement of inputs and outputs, cost-benefit and cost-effectiveness analysis, and structure and functioning of markets. In addition, the role of government in a private economy in dealing with market failure is discussed, especially as it relates to the goal of as suring universal access to health care. Does not require any specific preparation in economics or mathematics, although graphical presentation of economic concepts is emphasized. Recommended corequisite: HSMP 574.

Also offered as HSMP 586 and may be taken only once for credit.

## HSMP 689 - Research Design in Health Services (3)

Provides an introduction to traditional methods of designing and conducting health services research. It is intended that at the completion of the course students will understand multiple approaches to health services research, be able to be both participants in and consumers of the research process, and will be competent in conducting critical apprais als of the health services literature and in writing research proposals.
Also offered as HSMP 589 and may be taken only once for credit.
HSMP 699 - Special Studies (1-6)
(Credit to be arranged.)

## Hst - History

## Hst 101 - Age of Empires: The Medieval World (4)

Surveys his torical empires spanning medieval western Asia, the Middle East, north Africa, andEurope during the period fromroughly 400-1450 C.E. Part of sequence consisting of: Hst 101: Age of Empires: The Medieval World; Hst 102: Early Modern Europe and the W orld; Hst 103: Modern Europeand the W orld.

## Hst 102 - Early Modern Europe and the World (4)

Surveys the history of early modern Europe and its interregional and global connections fromroughly 1400-1800
C.E. Part of sequence consisting of: Hst 101: Age of Empires: The Medieval World; Hst 102: Early Modern Europe and the World; Hst 103: Modern Europe and the World.

## Hst 103 - Modern Europe and the World (4)

Surveys the history of modern Europe and its interregional and global connections fromroughly 1800 C.E. to the present. Part of sequenceconsisting of: Hst 101: Age of Empires: The Medieval World; Hst 102: Early Modern Europe and the World; Hst 103: Modern Europe and the World.

## Hst 104 - Introduction to World History (4)

A survey of world history fromearliest times to the present, combining both chronological and thematic approaches. Hst 104: Origins to 1000 CE, Hst 105: 10001600 CE, Hst 106: 1500-present. This is the first course in a sequence of three: Hst 104, Hst 105, and Hst 106.

## Hst 105 - Introduction to World History (4)

A survey of world history fromearliest times to the present, combining both chronological and thematic approaches. Hst 104: Origins to 1000 CE, Hst 105: 10001600 CE, Hst 106: 1500-present. This is the second course in a sequence of three: Hst 104, Hst 105, and Hst 106.

## Hst 106 - Introduction to World History (4)

A survey of world history fromearliest times to the present, combining both chronological and thematic approaches. Hst 104: Origins to 1000 CE, Hst 105: 10001600 CE, Hst 106: 1500-present. This is the third course in a sequence of three: Hst 104, Hst 105, and Hst 106.

## Hst 199 - Special Studies (0-12)

See department for course description. (Credit to be arranged.)

## Hst 200 - Topics in History Wars (4)

Explores, analyzes, and assesses impas sioned public debates about the past for different periods of his tory. Considers his torical debates where facts are contested or do not seem to matter, the role of credentialed experts in contemporary debates, and the place of historical methodologies. Case studies are used to examine how contested collective memories address the past, helpus to understand the present, and illuminate the importance of
historical practice. Course may be repeated up to three times for credit.

## Hst 201 - History of the United States (4)

General survey of United States history. Hst 201: colonial era to 1840; Hst 202: 1840 to 1914; Hst 203: 1914 to present.

## Hst 202 - History of the United States (4)

General survey of United States history. Hst 201: colonial era to 1840; Hst 202: 1840 to 1914; Hst 203: 1914 to present.

## Hst 203 - History of the United States (4)

General survey of United States history. Hst 201: colonial era to 1840; Hst 202: 1840 to 1914; Hst 203: 1914 to present.

## Hst 210 - The Ancient World (4)

An introductory survey into the political, social, economic, and culturalhistory of the Ancient World, concentrating mainly on the Ancient NearEast, Greece, and Rome.

## Hst 230 - The History of Now: Recent US History Connected to the Past (4)

Explores contemporary topics, is sues, and events in the United States and identifies moments or periods in the American historical past that will provide context and enhance student's understanding of the present. We will examine current political, social, and cultural topics and events regarding race, gender, class, and sexual identity in the US, and look to history to provide context. We will also look at current economic, political, and diplomatic events and use the past to enhance our understanding of the world around us.

## Hst 270 - A World History of Love (2)

Surveys religious, philosophical, and scientific writings on love from the ancient world to late modernity. An introduction to the history of emotions and "emotionology" as a method of inquiry. Special attention paid to Judaism, Christianity, and Is lamin the Middle Ages, as well as to colonialism, nationalis $m$, and family in the early modern and modern periods.

## Hst 280 - World War I: Global Perspectives (4)

A global view of one of the modern world's formative moments: the First World War. Examines its cultural, political, economic and social history to understand the war's trajectory and consequences across the globe.

## Hst 297 -History through Film (4)

Introduction to selected topics of modern history through the viewing and analysis of important documentaries and feature films. The subject matter will vary from term to term.

## Hst 299 - Special Studies (1-12)

(Credit to be arranged.)

## Hst 300 -Historical Imagination (4)

The how and why of the historian's craft: (1) an introduction to the basics of research and writing; (2) an examination of historical writing, its relation ship to the time and place of its origin, and the emergence of the ideas, consciousness, and canons of scholars hip which shaped it. This course serves as an introduction to the study of history at the upper divisionlevel and is recommended for students beginning their junior year.
Hst 312U.

## Hst 301 - Women in African History (4)

Surveys the rich and deeply layeredhistory of African women, especially froman African pers pective. We will examine the historical forces that shaped, and continue to shape, African women's lives, as well as the ways in which African women have been agents in the making of their own histories. This courseilluminates the critical role which African women, of varying nationalities, classes, ethnicities, religions, and regions, have played in African and globalhistory.
Cross-Listed as: This is the same course as BSt 301 and may be taken only once for credit.

## Hst 309U - The Roman Republic (4)

A study of the political, social, economic, and cultural history of the Roman world between the 8th and 1st centuries BCE .

## Hst 310U- The Roman Empire (4)

A study of the political, social, economic, and cultural history of the Roman world between the 1st century BCE and the 4th century CE.

## Hst 311 - Introduction to the NewTestament (4)

We will study the diverse writings of the NewTestament as products of their original his torical, social, and religious contexts. We will ask how these ancient writings came to be written, collected and preserved and how they served to interpret and respond to the life situations of the earliest Christians. This course may be repeated once for credit.
Cross-Listed as:This is the same course as JSt 311.

## Hst 312U- African History Before 1800 (4)

An upper division course designed to survey the history of the African continent fromearliest times to the period of the Atlantic slave trade. Using a lecture/dis cussion format, the course will examine the impact of trade, technology, and ecology on the transformation of African societies before 1800. This is the same course as BSt 305U and may be taken only once for credit. Expected preparation: Upper-division standing.

Cross-Listed as: BSt 305U.

## Hst 313U - African History Since 1800 (4)

An upper division course designed to survey the his tory of the African continent from 1800 to the present, with emphas is on the era of the Atlantic slave trade, colonial period, independence, and post independence. This is the same course as BSt 306U and may be taken only once for credit. Expected preparation: Hst 312 or upper division standing.

Cross-Listed as: BSt 306U.

## Hst 314U - Ancient Near East and Egypt (4)

Covers the Stone Ageto the death of Alexander the Great in 323 BC , from Afghanistan to Egypt. Topics include the agricultural re volution, the origin of cities and ancient empires, Gilgamesh, the Bible, and the Persians.

## Hst 315U - History of Ancient Greece (4)

A survey of the social, political, economic, and cultural history of the Greeks and their neighbors. Fromearliest beginnings through the Hellenistic age.

## Hst 316U - Roman History (4)

A study of the social, political, economic, and cultural history of the Mediterranean region between 753 BCE and the fall of Rome.

## Hst 317U - Jewish History from Antiquity to the Medieval Period (4)

Introduces students to the Jewish his torical experience from its Biblical origins through theend of the first millennium CE primarily by means of close readings of primary sources. Describes the diverse forms of Jewish life under Persian, Greco-Roman, Early Christian and Muslim rule and examines the boundaries of pre-modern Jewish cultural and religious identity. This is the same course as JSt 317 and may be taken only once for credit.
Cross-Listedas:JSt 317U.

## Hst 318U - Jewish History from the Medieval Period to the Present (4)

Survey of Jewish his tory from the year 1000 to the present, covering major developments in Jewish society and culture in the medieval Is lamic and Christian realms, early modem Europe and the Middle East, and the modern world. Topics include religious thought, communal and political structures, and Jewish/non-Jewish relations. This is the same course as JSt 318 and may be taken only once for credit.
Cross-Listed as: JSt 318U.

## Hst 319U- Rabbinic Culture in the Roman World (4)

Introduction to history and literature of the rabbinic movement in Roman Palestine, 70CE-500 CE. Origins of the rabbis, their role in society, genres of rabbinic literature (Mishnah, Talmud, Midrash), rabbinic law and theology and rabbinic attitudes towards the urban culture of the Roman Near East. This is the same courseas JSt 319 and may be taken only once for credit.
Cross-Listed as: JSt 319U.

## Hst 320U - East Asian Civilizations (4)

Origins and development of East Asian civilizations from the earlies thuman cultures to around 1300 . Focus on interactions between Chinese influences and indigenous traditions in Japan, Korea, and Vietnam; Confucianism, Buddhism, and other religious traditions; social organization, economies, and political institutions; cultural, artistic, and literary traditions.

## Hst 321U - Early Modern East Asia, 1300-1800 (4)

East Asia fromthe era of the Mongol conquests through European contacts, encompassing the Yuan, Ming, and Qing dynasties in China, Choson Korea, and the Ashikaga through Tokugawa periods in Japan.

## Hst 322U - Modern East Asia (4)

History of East Asia fromaround 1800 , beginning with the Opium Wars in China and the Meiji Restoration in Japan, through postwar state and society in Japan and the People's Republic of China. Some attention to Korea, Vietnam, and Taiwan. Emphasis on concepts of imperialism, Westernization, modernization, and revolution.

## Hst 323 -Modern Korea (4)

Korea's modern his tory is as complexas any national history, with colonization from 1905-1945 followed by the political division of the Korean nation that, after a terrible civil war that played out in the context of the Cold War, left two states competing for the legitimacy to rule over Korea.

## Hst 324 - United States Civil Rights Movements (4)

Examines the rise of the Black Power and the Chicano movements of the 1960s and 1970s in comparative perspective, as well as the American Indian, Women's Liberation, LGBTQ, and Asian American Movements. Topics include racial and ethnic cultural nationalism, selfdetermination, discrimination, police/state violence, community control, and cross-racial/cross-ethnic org anizing. These social movements are set within a global context framed by the VietnamWar, Anti-Colonialism, Feminism, "Third World" student activism, state/police violence, and the counterculture of the 1960s.

## Hst 325-Chicano/a History, 1492-1900 (4)

Mexican American/Chicano/ahistory from the Conquest of the Americas to 1900 with an emphasis on empire, civil rights, identity, culture, sexuality, and war. This is the same course as ChLa 325 and may be taken only once for credit.

Cross-Listed as: ChLa 325.

## Hst 326U - Chicano/a History, 1900-Present (4)

Mexican American/Chicano/ahistory from 1900 to the present with an emphasis on migration, ethnicity, labor, civil rights, identity, and culture. This is the same course as ChLa 326U and may be taken only once forcredit.
Cross-Listed as: ChLa 326U.
Hst 327U U.S. History 1890-1932 (4)
A survey of political, social, cultural, and economic history covering Populismand the Crisis of the 1890s, the Purity Crusade, Corporate and Anticorporate Progressive Reform, World WarI, the League of Nations and Red Scare of 1919-20, the New Era and Cultural Conflicts of the 1920s, and the 1929 stock market crash. In doing so, the class
addresses the presidencies of William McKinley, Theodore Roosevelt, WilliamHoward Taft, Woodrow Wilson, Warren G. Harding, Calvin Coolidge, and Herbert Hoover.

## Hst 328U- U.S. History, 1932-1960 (4)

A survey of political, social, cultural, and economic his tory covering the Great Depression of the 1930s, Noninterventionist Sentiment and W orld W ar II, Cold War Domestic and International Anti-Communism, and the Early Civil Rights Movement. In doing so, theclass addresses Franklin D. Roosevelt's New Deal and the presidencies of Harry Truman and DwightD. Eisenhower.

## Hst 329U- U.S. History, 1960-Present (4)

A survey of political, social, cultural, and economic history covering the Cold W ar and Vietnam, Sixties Civil Rights and Radical Activis m, Watergate, the Rise of Populist Conservatism, the Emergence of the Global Economy, and Political Polarization. In doing so, the class addresses the presidencies of JohnF. Kennedy, Lyndon B. Johnson, Richard Nixon, Jimmy Carter, Ronald Reagan, George H. W. Bush, Bill Clinton, and their successors.

## Hst 330U- Native Americans of Eastern North America (4)

Examines the origins of the Eastern W oodlands societies, surveys their culture around the time of European colonization, and considers how that culture changed in response to the arrival of Europeans to the North American continent. Traces the development of the major Native American nations of the region and explores how those nations res ponded to the policy of the United States in the 19th and 20th centuries.

## Hst 331U- Native Americans of Western North America (4)

Explores the history of peoples native to Western North America in the American Southwest and Pacific Coast regions, and in British Columbia. Covers the period from precontact to the present and considers the responses from native nations to the re-peopling of the West as well as examining U.S. and Canadian federalpolicy.

## Hst 333U - Food and Power in US History (4)

Course uses the topic of food to better understand the his tory of American culture, environments, social relations, technology, territorial expansion, immigration, gender relations, agribusiness, and international politics. Topics
move chronologically from the colonial period through the twenty-firstcentury.

## Hst 334U - History of Canada (4)

Survey of the social, economic, and political history of Canada from the sixteenth century to the present. Topics include colonialism, First Nations peoples, evolution of government, Canadian-U.S. relations.

## Hst 335U- Race and Ethnicity in U.S. History (4)

This course studies thehistory, meaning and construction of racial and ethnic identities in the U.S. from European colonialismto present. It engages the ways in which social practices, science, economics, cultural images, and local and federal laws worked to attach meaning to the ideologies of racial and ethnic identities.

## Hst 337U - History of American Cities (4)

Traces the evolution of urban centers fromthe colonial period to the present. Focuses on the developing systemof cities, on growth within cities, and on the expansion of public responsibility for the welfare of urban residents. Particular attention is given to the industrial and modern eras.

## Hst 338U- Oregon History (4)

Explores the political and social history of the area most of us call home: Oregon Country, Oregon Territory, and the state of Oregon. Through lectures, readings, film, and discussion we will examine the connections between the local, national, and international as they pertain to this place. Topics considered include Oregon as Indian Country, Black Exclusion laws, the natural resource economy, the TomMcCall era, and Rajneeshees as new pioneers.

## Hst 339U- The Environment and History (4)

Introduction to the global history of human interactions with the environment fromantiquity to the present, with a special focus on the his tory of political, social, cultural, and economic forces that have produced modern relationships to nature. Designed as an introductory course for students of all majors.

## Hst 340U- Women and Gender in America to 1848 (4)

Surveys the history of women in the middle North American continent to 1848 . It highlights theexperiences
of and relationships among women of diverse origins, especially Native women, African women, and European women. Key themes includefamily, kinship, and sexgender systems; colonialismand slavery; religious life; politics and the law; nation-building and the rise of modem citizenship.

## Hst 341U- Women and Gender in the United States 1848-1920 (4)

Explores the diverse experiences of women in the United States between 1848 and 1920. Key themes include slavery, emancipation, and Reconstruction; colonialism and res is tance; women's rights and social reform; education and wage labor; immigration/migration; and Victorianismand sexualmodernism.

## Hst 342U- Women and Gender in the U.S. 1920 to the Present (4)

Surveys women's lives and gender change in recent U.S. history. Among our themes will be women in politics, the work force, and social movements as well as changes in family life, gender identities, and sexuality. Women's roles in globalization, the media, and popular culture will figure throughout.

## Hst 343U - American Family History (4)

Examines the history of the many types of the families in what is now the United States fromthe period of colonial settlement in the 1500s to the present day. Course utilizes primary source texts and recent scholarship on the family to understand not only the complexity and diversity of families, but also the varied impacts of historical change on the structures, meanings, and adaptations of families. Special focus on understanding the formation and changing nature of gender norms, family strategies, race, class, immigration, and ethnicity.

## Hst 344U- Culture, Religion, Politics: Jews and Judaismin AmericaSince WorldWar Two (4)

Surveys significantreligious, cultural, and political developments in American Jewry since the end of World War Two. Topics include theimpact of the war and the Holocaust; liberalism, radicalism, and neoconservatism; suburbia; the counterculture; the fading of immigrant memory; Jewish feminism; the orthodoxrevival; relations with African-Americans and other minority groups; and the relationship between American Jewry and the State of Israel.

## Hst 345U- Colonial America, 1607-1756 (4)

Survey of British North America fromthe planting of the English colonies to the eve of the Seven Years ' W ar. Topics include relations between Europeans and Native Americans, women's status and roles, religious ferment, constitutional development, and the colonial economy.

## Hst 346U- The American Revolution, 1756-1800 (4)

Survey of the American Revolution fromits origins to the Early Republic. Topics include the pre-Revolutionary crises, the W ar of Independence, the Confederation, and the framing of the Constitution.

## Hst 347U- Antebellum America, 1800-1850 (4)

Survey of the history of the United States from 1800 to 1850. Topics include the W ar of 1812, U.S. territorial expansion, Jacksonian democracy, Indian removal, reform movements, the transportation revolution, and the development of the market economy.

## Hst 348U- Slavery, the American Civil War, and Reconstruction, 1850-1877 (4)

Survey of the history of slavery in the United States. Topics include the political, social, and economic circumstances that helped bring on the American Civil war, as well as the military history of the war, the consequences of the conflict, and the reconstructio n of the Union.

## Hst 349U- United States Indian Policy (4)

Examines the history of the United States government's policy toward the Indigenous nations of North America. In particular, considers the Indian policies of the European colonial powers, the federal government's creation and implementation of policies regarding Indigenous polities, the conflicts and relationships between Native nations and the state and federal governments, the origin of the Indigenous sovereignty movement, and the construction of Native rights by the state and federal courts of the United States.

## Hst 350U- English History from 1066 to 1660 (4)

Designed to survey the history of England from the conquest in 1066 through the English Civil Wars and the ensuing period when England was without its monarchy in the mid-seventeenth century. Using a lecture/discussion format, explores significant events and developments in the governance, society, economy, and religion of England during this period.

## Hst 351U - English History from 1660 to the Present (4)

Des igned to survey the his tory of England fromthe restoration of the monarchy in 1660 to the present time. Using a lecture/dis cussion format, explores significant events and developments in the governance, society, economy, and religion of England during this period.

## Hst 352U-European Women's History to 1700 (4)

An upper-division course designed to survey the his tory of women and the changing social construction of gender in Europe from c. 1000 to $c .1700$. Explores the impact of social, intellectual, economic, and political changes, as well as significant events such as the Black Death and recurring religious change.

## Hst 354U Early Medieval Europe: 300-1100(4)

A survey of political, cultural, intellectual, religious, social, and economic aspects of Western Europe and the Mediterranean, including the decline of Roman imperial might in Europe, the spread of Christianity, the Is lamic, Viking, and Byzantine spheres, the rise and decline of the Carolingian Empire, the roles of women and gender, and the growth of feudal society around the year 1000 .

## Hst 355U- Late Medieval Europe, 1100-1450 (4)

Examines the late Middle Ages through primary sources emphasizing cultural, social, political, and intellectual trans formations. Subjects include the twelfth-century cultural "renaissance," the emergence of European states and the papal monarchy, the rise of religious dissent and persecution of minorities, the transformation of medieval spirituality, the Crusades, European expansion and external encounters, growth of cities and the university, and the late medievalbubonic plague pandemic.

## Hst 356U- Renaissance and Reformation Europe, 1400-1600 (4)

Surveys the cultural, social, intellectual and political aspects of the European Renaissance and Reformation. Emphasizes reading and analysis of contemporary source materials. Subjects include: the growth of urban culture and civic humanismin Italy, the redis covery of classical literature and philosophy, court life and mores, the Catholic and Protestant reformations, witch-hunts and religious violence, and European exploration and exploitation of the Atlantic.

## Hst 357U- Europe from Reformation to Revolutions (4)

Majordevelopments in European social, political, economic, cultural, and intellectual history fromthe late 16th through the mid-19th centuries.

## Hst 358U - Europe from National Unification to European Union (4)

Majorevents (World Wars I and II), socio-political movements (communism, fascism, Nazism), people, and themes in European his tory from the mid-19th century to the present.

## Hst 359U- Farly Modern France (4)

A survey of the history of France during the Reformation, the Age of Absolutis m, and the Enlightenment, 1515-1778.

## Hst 360U- The French Revolution and Napoleon (4)

A survey of the history of France during the Revolution and Napoleonic era, 1778-1815.

## Hst 361U- Modern France \& the World since 1815 (4)

Examines the France and its role in the world from 1815 to present, including revolutions, res torations, empire, world wars and nationalidentity.

## Hst 362U- Amazon Rain Forest (4)

Examines different ways in which the Amazon has been perceived through time. This course is the same as Intl 362 ; course may only be taken once for credit.

Cross-Listed as: Intl362U.

## Hst 363U- History of the British Empire (4)

Surveys fourcenturies of the expansion and decline of the British Empire. Emphasis on the military, political and economic history of imperialis $m$, the comparative study of colonial territories, and the emergence of post-colonial societies.

## Hst 364U - Modern Brazil (4)

Examines such topics as slavery, abolition, messianism, banditry, the Amazon, race, military rule, and democratization in the making of modern Brazil. This course is the same as Intl 364 and may only be taken once for credit.

## Hst 365U-History of Latin America, 4000 BCE- 1810

 (4)A survey frompre-Columbian times ending with Latin American independence. (4000 B.C.E. to 1810). Topics include: Paths across oceans, domesticating corn, potatoes, grains, animals; Olmecs, Maya, Toltecs, Teotihuacan, Purepecha, Mexica, Chimu, Incas, 1st peoples Brazilian basin; the Encounters; colonial mining economy; rise of Latin American consciousness, slavery, racial construction, Native American res is tances; Catholic syncretism; Bourbon and Pombal reforms; Caribbean uniqueness; Haitian revolution; Portuguese Empire out of Brazil; Napoleon; rejection of Spanish political reforms, independences.

## Hst 366U-History of Latin America, 1820-Present (4)

Course examines:Independence, search for autonomous political purpose, European economic penetration, His panis mo, colonialis mand slavery, U.S. imperial outreach, regional revolutions, armies and nation building, the model of "development", import substitution, Japanese emigration, artistic revolutions, indigenism, world wars, Cold War, liberation theology, music, food, autonomous res is tance, role of labor, satisfying western needs (tourism, stimulants, individual and labor exploitation), mega cities, mis sing the computer age, NAFTA vs. Chinese manufacturing, failing states, neo-authoritarianism, Covid19.

## Hst 368 - Brazil and Mexico in the 20th Century (4)

A comparative history of these rising powers of Latin America, including economic, diplomatic and cultural history, and the history of revolution, popular protest, spirituality and the visual arts.

## Hst 369U- Women in World History (4)

Explores the history of women from "prehistory" to the modern era. Themes include work, marriage, empire, and slavery. Through primary and secondary sources, students will examine gender as a social construct in the human past and as a criticalcategory of analysis in the present.

## Hst 370 - Eurotopia: Creating \& Contesting the European Union (4)

Examines the intellectual, political, and economic challenges to forging European unity, and the paradoxthat twentieth-century Europe witnessed the triumph of the nation-state at the same time that they developed supranationalagencies to contain it.

## Hst 371 - Queerness andDifference in European History (4)

Examines the history of same-sexdesire and theidentities of gender-nonconforming people in Europe through the lens of religious, ethnic, national, and racial difference. Explores how queer identities intersected with other categories of belonging from the Middle Ages to the 20th century. Topics include queerness and medieval religious difference, perceptions of queerness in the disabled body and the Jewish body, and fascism's merging of social groups perceived as subhuman or degenerate, including Jews, Roma, disabled people, and queers.

## Hst 372 - History of Antisemitism (4)

Surveys the development of hostility towards Jews from antiquity to the present day. We will explore how antiJewish hatred has persisted over millennia even as it has adapted to individual historical and geographic contexts. Topics include anti-Jewishbias in the ancient world and foundational Christian sources; social and economic marginalization in medieval Europe; the emergence of political and racial antisemitismin the nineteenth century; Nazi antisemitism; and contemporary developments, including left-and right-wing antisemitis $m$.
Cross-Listed as:This is the same course as JSt 372 and may be taken only once for credit.
Hst 375U - History of Kievan and Muscovite Russia, 800s-1700 (4)

Explores Kievan Rus and Muscovite Russia. Emphasis on political change, social conflicts, and identity formation through the appanage period. Mongol rule, the rise of Muscovy, and territorial expansion.

## Hst 376U-History of Imperial Russia, 1700-1917 (4)

Studies the Russian Empire from its founding to the Russian Revolution of 1917. Emphas is on attempts at reform, and on political and cultural identity formation of various social groups and nationalities of the empire.

## Hst 377U-History of the Soviet Union and Post-Soviet Russia (4)

Studies the Soviet Union fromits founding in 1917 to the early post-Soviet period. Emphas is on socialismas theory and policy, and on political and cultural identity formation of various social groups and nationalities of the Soviet Union.

## Hst 378U- Pagans, Christians andJews (4)

Discusses the development and interaction of Roman paganism, Christianity and Judaismduring the period of Late Antiquity. Topics include education, philosophy, asceticism, ritual, religious law, the image of the holy man and the phenomenon of religious polemic in the Later Roman Empire (c. 250-600 CE). This is the same course as JSt 378U and may be taken only once for credit.
Cross-Listed as:JSt 378U.

## Hst 379U- History of Zionism (4)

Zionismas ideology and practice in context of Jewish and European his tory. Includes society and culture Zionism created under the British mandate of Palestine, roots of the Arab-Jewish conflict in this context, and impact on Jewish life and politics in Eastern and CentralEurope and the United States. this is the same course as JSt 379U and can only be taken oncefor credit.
Cross-Listed as: JSt 379U.

## Hst 380U- The Holocaust (4)

An introduction to the Nazi-planned and-executed genocideof European Jewry known as the Holocaust.
Topics includes the German and European contexts for the rise of Nazism; antisemitismand its links to Nazi ideology and policy; European Jewry in the interwar period; the "FinalSolution"; resistance and "bystanders." This is the same course as JSt 380U and may be taken only once for credit.

Cross-Listed as: JSt 380U.
Hst 381U- Kabbalah: The Jewish Mystical Tradition (4)

Surveys the origins and development of the Jewish mystical tradition set against the context of Jewish religious, social, and intellectual history. Topics include mystical visions in ancient Jewishtexts, medieval Kabbalah and the Zohar, the Sabbatean mes sianic movement, Hasidism, and contemporary uses of Kabbalah. This is the same course as JSt 381U and may be taken only once for credit.

Cross-Listed as: JSt 381U.

## Hst 382U - Palestine andIsrael (4)

A critical review of the 19th and 20th century social, cultural, economic and political factors behind the formation of two modern Middle Eastern nations, Palestine and Israel. Recommended prerequis ite: upper division standing.

## Hst 383U - Modern Iraq and Syria (4)

A survey courseexamining the modern history of Iraq and Syria from the late nineteenth century to the present day,
with the goal of providing historical context for contemporary political, cultural, economic, and military conditions in both states.

## Hst 384U- Ottoman World (4)

An overview of Balkan and Middle Eastern history from late-medieval to early modern times (c. 14th-18th centuries). Major themes include the rise of the Ottoman Empire, the Ottomans and the early modern world (c. 1500-1800), evolution of the Ottoman state, law and religion, economy and society, and popular culture and lifestyle.

## Hst 385U - Late Imperial Middle East, 1700-1914 (4)

Survey of the social, political, economic, and cultural history of the Middle East fromthe 18th century till the outbreak of World War I. Coverage of key themes such as imperialis $m$, political reform, sectarianism, constitutionalism, and revolution.

## Hst 386U- Middle East in the Twentieth Century (4)

Overview of the Middle East since W orld War I. Discussion of colonialismand nationalism, emergence of mass society, economic development, birth of the ArabIs raeli conflict, Cold War, oil, and the rise of political Is lam.

## Hst 387U- History of Modern Science (4)

Examines the interplay between science as a system of knowledge and science as the institutions by which that knowledge is produced. Through reading, lectures, independentresearch, and discussion, the course explores how science has affected and been affected by political, social, and cultural developments. Primary focus is Europe and America from the 16th century to the present, but global pers pectives will also be considered.

## Hst 390U- Topics in World History (4)

Provides an overview of a particular period and/or theme in world history. Students will focus on majortrends and/or connections related to the specific topic. Coverage will be global in breadth. Acceptable for the W orld History minor.

## Hst 399 - Special Studies (1-12)

See department for course description. (Credit to be arranged.)

## Hst 401 - Research (0-6)

See department for course description. (Credit to be arranged.) Consent of ins tructor.

## Hst 403 - Honors Thesis (1-4)

(Credit to be arranged.)

## Hst 404 -Public History Internship(1-12)

Intensive, on-the-job internships with public agencies, private businesses, non-profit firms, and other groups in public history work. Each internship is by special arrangement and terms. Expected preparation: Hst $496 / 596$, or consent of ins tructor.

Also offered for graduate-level credit as Hst 504. .

## Hst 405 - Reading and Conference (0-9)

(Credit to be arranged.)

## Hst 407 -Seminar (1-8)

Study and application of the techniques of historical research and writing.
Also offered for graduate-level credit as Hst 507. . Prerequisite: Hst 300 and Hst 405 or consent of the instructor. .

## Hst 410 -Selected Topics (1-6)

See department for course description. (Credit to be arranged)

## Hst 411 - Public History Lab (4)

Lab course will focus on a specific sub-field in Public History. Working professionals will instruct students in the latest techniques used in public his tory work. One lab course is required for graduate students taking the public history track in the M.A. in history.

Prerequisite: Hst 496/596.

## Hst 412 - Topics in African History and Culture (4)

An in-depth exploration of selected topics in African cultural history. Special attention will be given to thematic is sues of broad application to the understanding of cultural interaction, continuity, and change. The subject matter will vary from term to term. (Maximum number of credits is 12; 4 credits each for three courses with different topics.)
Also offered for graduate-level credit as Hst 512. .
Prerequisite: Upper-division standing.

## Hst 413 - Topics in Transnationalism (4)

Examines human activities, institutional structures, and social movements that cross national boundaries. Topics include migration, diaspora, and activism, as well as flow of ideas, goods, and technologies among people or regions not defined primarily by the nation-state. Frameworks for study include border zones, deterritorialized nations or peoples, and global citizenship.
Also offered for graduate-level credit as Hst 513. . Prerequisite: Upper-division standing.

## Hst 415 - Topics in Greek History (4)

An advanced look at specific topics in Greek history from the Bronze Age to the death of Cleopatra. Topics will include social, political, economic, intellectual, and religious history. The subject matter will vary fromterm to term. (Maximum number of credits is 12; 4 credits each for three courses with different topics.)
Also offered for graduate-level credit as Hst 515. .
Prerequisite: Upper-division standing.

## Hst 416 - Topics in Roman History (4)

An advanced look at specific topics in Roman history from the Etruscans to the Dark Ages. Topics will include social, political, economic, and intellectual history. The subject matter will vary fromterm to term. (Maximum number of credits is $12 ; 4$ credits each for three courses with different topics.)
Also offered for graduate-level credit as Hst 516. .
Prerequisite: Upper-division standing.

## Hst 420 - Topics in Early Modern Japanese History (4)

Selected themes in Tokugawa (1600-1850) history, including rural life and urbanization, merchants and commerce, political thought and institutions, women and family life, neo-Confucianism, religious beliefs and practices, popular culture, arts, and literature. (Maximum number of credits is $12 ; 4$ credits each for threecourses with different topics.)

Also offered for graduate-level credit as Hst 520. .
Prerequisite: Upper-division standing.

## Hst 421 - Topics in Modern Japanese History (4)

Selected themes in modern Japanese history, including the construction of the nation-state, modernization, Japan's drive to great power status, Japan's emergence as an imperialist power, state-society relations, and modernity outside Europe. (Maximum number of credits is 12; 4 credits each for three courses with different topics.)
Also offered for graduate-level credit as Hst 521.. Prerequisite: Upper-division standing.

## Hst 422 - Topics in Postwar Japanese History, 1945present (4)

Selected themes in postwar Japanese his tory, including the Occupation reforms (1945-52) and Japan's place in the Cold War system, the so-called "economic miracle," the development of a mass consumer culture, and U.S.-Japan relations. (Maximum number of credits is 12; 4 credits each for three courses with different topics.)
Also offered for graduate-level credit as Hst 522. .
Prerequisite: Upper-division standing.

## Hst 423 - Topics in Chinese Social History (4)

This course will examine institutions and themes-relating to the family, urban and rural life, education and the like-in Chinese social history. The subject matter will vary from term to term. (Maximum number of credits is 12; 4 credits each for three courses with different topics.)
Also offered for graduate-level credit as Hst 523. . Prerequisite: Upper-division standing.

## Hst 424 - Topics in Chinese Thought and Religion (4)

Study of selected topics in intellectual and cultural his tory related to Confucianism, Buddhism, Daoism, and other philosophicaland religious constructs. The subject matter will vary fromterm to term. (Maximum number of credits is 12; 4 credits each for three courses with different topics.)
Also offered for graduate-level credit as Hst 524. .
Prerequisite: Upper-division standing.

## Hst 425 - Modern China (4)

His tory of China from decline of imperial systemthrough century of revolution that culminated in founding of People's Republic of China in 1949. Post-1949 focus on critical periods and is sues in state-society relations, economic and political reform, and cultural changes, including global posture and relations with the West.
Also offered for graduate-level credit as Hst 525. .
Prerequisite: Upper-division standing.

## Hst 427 - Topics in the History of Science (4)

An in-depth investigation of a selected theme in the his tory of science and its cultural, social, or political relations. The subject matter will vary from term to term; topics include: science and religion, science under Nazism, science and Modernism, Darwinis mand social Darwinism, Scientific Revolution, and changing physical world pictures. Some previous study in history is recommended; a background in science is welcome, but not required or expected.
(Maximum number of credits is 12; 4 credits each for three courses with different topics.) Expected preparation: Upper-division standing.
Also offered for graduate-level credit as Hst 527. .

## Hst 429 - Topics in U.S. Cultural History (4)

A lecture course that explores selected topics in modern U.S. political culture and cultural expres sion. Maximum number of credits is 12; 4 credits each for three courses with different topics. Expected preparation: Upper-division standing.
Also offered for graduate-level credit as Hst 529..

## Hst 430 - Roots of American Culture (4)

Relation of cultural attitudes and values to the American historical experience from 1600-1860. Topics include the European legacy;Puritanis m; race, class, and ethnicity; American Enlightenment and Revolution; Cultural Nationalis m; Industrial Ethic and Pastoralism; Jacksonian Democracy; Manifest Destiny and Native Americans; Slavery and African American Culture; Evangelicalism, Reform, Abolitionism, and Feminism.
Also offered for graduate-level credit as Hst 530 and may be taken only once for credit. . Prerequisite: Upperdivision standing.

## Hst 431 - Rise of American Corporate Culture (4)

Relation of culturalattitudes and values to the American historical experience from 1860-1945. Topics include Civil W ar and Reconstruction; Incorporation, Labor Reform, and Utopian Thought; Populism; Progressive Reform; Two Cultures of the 1920s; Depression Realism and Radicalis m; World War II and the Judeo-Christian Consensus.
Also offered for graduate-level credit as Hst 531 and may be taken only once for credit. . Prerequisite: Upperdivision standing.

## Hst 432 - Recent U.S. Political Culture (4)

Relation of cultural attitudes and values to the American historical experience from 1945 to the present. Topics include Anti-Communist, Nationalist, and Anticorporate Insurgence in the 1950s; Antiwar, Racial, Counterculture, and Feminist Ferment in the Protest Era; New Age and Postmodernist Thought; Populist Conservatismand Traditional Values, 1980-present.
Also offered for graduate-level credit as Hst 532 and may be taken only once for credit. . Prerequisite: Upperdivision standing.
Hst 433-American Social and Intellectual History,
1600-1865(4) 1600-1865(4)
Examines early history of American social and intellectual history, including is sues of race, class, religion and philosophy, ideology and politics, community, region, and labor.
Also offered for graduate-level credit as Hst 533 and may be taken only once for credit. . Prerequisite: Upperdivision standing.

## Hst 434 - U.S. Social and Intellectual History, 1865present (4)

Examines social and intellectual history of the United States from 1865 to the present. Includes discussion of race, class, religion and philosophy, ideology and politics, community, region, and labor.
Also offered for graduate-level credit as Hst 534 and may be taken only oncefor credit. .Prerequisite: Upperdivision standing.

## Hst 438 - American Economic History: the First Century (4)

The economic background of the W ar of Independence and the seeds of the Civil War. Industrialization, urbanization, and development of the frontier. Rise of big business and org anized labor. Laissezfaire, federalism, and the gradual emergence of the national government in economic policy. Changes in foreign trade and in the international position of the U.S. Expected preparation: Ec 201, 202.
Also offered for graduate-level credit as Hst 538 and may be taken only once for credit. .
Hst 439 - American Economic History: the 20th Century (4)
Economic impact of U.S. involvement in W orld W ar I. Postwar structural changes. Waning of laissezfaire. Causes of the Great Depres sion. Economic policies of Hoover and Roosevelt adminis trations. The New Deal reforms. World W ar II and emergence of the administered system. Evolution of the mixed economy and growing role of the government. The industrial-military complex and the social imbalance. Expected preparation: Ec 201, 202.
Also offered for graduate-level credit as Hst 539 and may be taken only once for credit. .

## Hst 440 - American Environmental History (4)

A survey of North American history that explores the relationships between ideas of nature, transformations of the environment, and theeffect of the environment on humans. Topics include colonialism; links between ecological change and race, class, and gender relations; the role of science/technology; agriculture, industrialization, and urbanization; and environmentalis $m$.

Als o offered for graduate-level credit as Hst 540 and may be taken only onceforcredit. .Prerequisite: upper-division standing.

## Hst 442 - Race, Class and Gender in the American West (4)

Examines the trans-Mis sissippiWest as a cultural meeting ground and explores the racial, class, and gender implications of new migrations to the region. Particular attention will be placed on the arid West and human
responses to landscape. Expected preparation:Hst 201, 202 or upper-division standing.
Also offered for graduate-level credit as Hst 542 and may be taken only once for credit. .

## Hst 444 - History of the Pacific Northwest (4)

The social, cultural, economic, and political as pects of the development of civilization in Oregon and Washington. The his tory of the region is related to national and international contexts. Expected preparation: Hst 201, 202.
Also offered for graduate-level credit as Hst 544 and may be taken only once for credit. .

## Hst 445 - History of Portland (4)

The historical growth of Portland and its metropolitan region, with major attention given to the 20th century. Emphasis is placed upon the process of urbanization and the consequences of the past decisions and actions as they relate to recent developments. Expected preparation: Upper-division standing.

Also offered for graduate-level credit as Hst 545 and may be taken only once for credit. .

## Hst 446 - Civil Rights and the Law: The History of Equal Protection (4)

An exploration of the history of the 14th Amendment Equal Protection Clause's impact on the civil rights of Women, African Americans, Mexican Americans, and others.

Prerequisite: upper-division standing.

## Hst 447 - U.S Constitutional History: Foundations (4)

Examines the intellectual origins, creation, and ratification of the American Constitution and the early efforts of the U.S. Supreme Court to construe that document.

Also offered for graduate-level credit as Hst 547 and may be taken only once for credit. . Prerequisite: Upperdivision standing.

## Hst 448 - U.S. Constitution: Nineteenth Century (4)

Examines the U.S. Supreme Court's role in the construction of modern America; includes dis cussion of the Court's decis ions on federalism, slavery, presidential war powers, reconstruction and civil rights, and industrialization.

Also offered for graduate-level credit as Hst 548 and may be taken only once for credit. . Prerequisite: Upperdivision standing.
Hst 449 - U.S. Constitution: Twentieth Century (4)
Examines how the U. S. Supreme Court's decisions in the twentieth century impacted the national economy,
federalism, and the civil rights and civilliberties of American citizens.

Also offered for graduate-level credit as Hst 549 and may be taken only once forcredit. .Prerequisite: Upperdivision standing.

## Hst 450 - Medieval England (4)

Examines political, religious, social, and economic as pects of the history of Eng land from approximately 800 to the end of the 14th century. Expected preparation: Upperdivision standing or permission of instructor.

Also offered for graduate-level credit as Hst 550 and may be taken only once forcredit. .

## Hst 451 - Early Modern England (4)

Examines political, religious, social, and economic as pects of the history of England from the 15th through the 17th centuries. Expected preparation: Upper-division standing.
Also offered for graduate-level credit as Hst 551 and may be taken only once for credit. .

## Hst 452 - Topics in the History of European Women (4)

Examines selected aspects of the his tory of European women, focusing on one or more specific regions, topics, and/or time frames. Possible topics include as pects of the history of women and religion, women and work, women acces sing power, and gender and religious identity.
Maximum number of credits is $12 ; 4$ credits each for three courses with different topics. Expected preparation: upperdivision standing.

Also offered for graduate-level credit as Hst 552. .

## Hst 453 - The Medieval City: Communities of Conflict and Consensus (4)

Emphasizes the social and cultural history of the medieval city from ca. 300-1500. Proceeding chronologically and thematically, explores how contemporaries imagined cities and urban life; the formation of civic consciousness and identity in feudal Europe; the commercial revolution and its cultural consequences; family and domestic life; the experience of marginalized elements; the construction, regulation, and function of urban space; and the role of spectacle, ceremony, and ritual, all as means to as sess how the urban community mediated conflict and sought elusive consensus. Expected preparation: Hst 101, 354, or 355 or upper-division standing.
Also offered for graduate-level credit as Hst 553 and may be taken only once forcredit. .

## Hst 454 - Topics in Medieval History (4)

Examines selected topics in the social, cultural, and /or religious history of the European Middle Ages, spanning the period fromroughly 300-1450 C.E. Topics will vary, but may include the study of sanctity and society, religious
dissent and reformation of the church, holy war and crus ade, regional and national political his tories, crosscultural studies, and other subjects. (Maximumnumber of credits is $12 ; 4$ credits each for three courses with different topics.) Expected preparation: Hst 101, 354, or 355 or upper-division standing.

Also offered for graduate-level credit as Hst 554. .

## Hst 455 - Topics in Renaissance History (4)

Identifies and examines those special aspects of W estern European civilization that mature roughly between 1300 and 1550 and that begin to set it apart fromthe medieval era. Not a survey of life during a period of time but a study of selected phenomena. Topics include the revival of antique (above all Latin and Greek) letters and attitudes, types of Humanism, new education ideals, secular outlook, the functions of Renaissance patrons, political theory and the growth of the "early modern state," Neoplatonism, and the spread of the Renaissance fromItaly to Northern Europe. (Maximum number of credits is 12; 4 credits each for three courses with different topics.) Expected preparation: Upper-division standing.
Also offered for graduate-level credit as Hst 555. .

## Hst 456 - Religious Change in Sixteenth Century Europe (4)

Examines the causes, characteristics, and consequences of the revolutionary changes in EuropeanChristianity that occurred during the 16th century: changes that are generally labeled "The Reformation." Expected preparation: Upper-division standing.
Also offered for graduate-level credit as Hst 556 and may be taken only once for credit. .

## Hst 457 - Topics in Early Modern Europe (4)

Examines selected topics in the social, cultural, political and/oreconomic history of Europe in the early modern period (roughly 1515-1815). Topics will vary, but may include European financial history, the cris is of the seventeenth century, popular revolt, the royal state, and other topics. May be taken a second time for credit (maximum 8 credits) with a different topic. Expected preparation: Upper-division standing.

Also offered for graduate-level credit as Hst 557. .

## Hst 458 - Modern Germany (4)

Examines aspects of the development of German political, social, and cultural life during the 19th and 20th centuries. Expected preparation: Hst 103, Hst 358.

Also offered for graduate-level credit as Hst 558 and may be taken only once for credit. .

## Hst 459 - Topics in Modern European History (4)

Examines a selected theme related to the history of modem Europe from (primarily) the 19th through the 20th centuries. Topics will vary, whether focusing internationally or on a single European nation, but will include the definition of Europe; dictatorship and sovereignty; nationalismand identity; society and the state; the experience of modern violence; trials and justice; world wars; comparative fascism; social and political transition, and war and society. May be taken a second time for credit (maximum 8 credits) with a different topic. Expected preparation: Hst 103 or 358 ; upper division-standing.
Also offered for graduate-level credit as Hst 559. .

## Hst 460 - Topics in European Intellectual History (4)

Examines a selected theme in the development of European thought in its social context; format includes lecture and the analysis and dis cussion of primary texts. May be taken a second time for credit (maximum 8 credits) with a different topic. Expected preparation: Upperdivision standing.
Also offered for graduate-level credit as Hst 560 and may be taken only once for credit. .

## Hst 461 - Topics in Jewish History (4)

Examines select as pects of Jewish history, focusing on one or more specific regions, periods, events, or concerns.
Possible topics include: medieval and early modern Jewish history, ancient Is raelite or rabbinic his tory and culture, Sephardic Jewry, his tory of Rus sian Jewry, and gender and Jewish history. Maximumnumber of credits is 12; 4 credits each for three courses with different topics. Expected preparation: upper division standing.

Also offered for graduate-level credit as Hst 561..

## Hst 464 - Indians of the Pacific Northwest (4)

Explores the history of peoples native to the Pacific Northwest with a special emphasis on natural resource allocation and the relationships between federal, state, and tribal governments in the 19th and 20th centuries. Expected preparation:Hst 201, Hst 202 or Hst 338U.
Also offered for graduate-level credit as Hst 564 and may be taken only once for credit. .

## Hst 465 - Twentieth Century Latin America (4)

Course examines: Positivism, Mexican Revolution, World War I, import substitution, comparison of Argentina, Mexico, Brazil and Peru in the 1920s, the Depression in Latin America, Nazi threats, U.S.Latin American cooperation WWII, the Cold W ar, Cuba as watershed, Alliance for Progress, Liberation theology, Soviet, Cuban, Chinese, Trotzky ite rivalries, Dirty wars, Central American revolutions, implosion of Mexican development model,
democracy, rise of digital worlds, stimulants, tourism, Nafta, U.S. disregard.

Also offered for graduate-level credit as Hst 565 and may be taken only once for credit. . Prerequisite: Upperdivision standing.

## Hst 468 - History of Mexico I: 4000 BCE-1821 (4)

Study of Mexico's beginnings frompre-Columbian times through the colonial period. The origins of Mexican culture, society, economy, and political institutions will be examined in the context of Hispanic and indigenous contributions.

Also offered for graduate-level credit as Hst 568 and may be taken only once for credit. . Prerequisite: Upperdivision standing.

Hst 469 - History of Mexico II: 1810-1876(4)
Study of Mexico's his tory from the revolutions for independence until 1876. Emphasis on the development of constitutional government, the era of reform, foreign interventions, and the restoration of the republic.

Also offered for graduate-level credit as Hst 569 and may be taken only once for credit. . Prerequisite: Upperdivision standing.

Hst 470 - History of Mexico III: 1876-Present (4)
Mexico's emergence as a modern nation during the Porfirian dictatorship. The 20th century revolutionary upheaval and consolidation.
Also offered for graduate-level credit as Hst 570 and may be taken only once for credit. . Prerequisite: Upperdivision standing.

## Hst 471 - Chicanx Labor History in the USA (4)

A study of the development and growth of Chicanxlabor movements in the 20th century. The first part of the course will focus on movements prior to 1960 , and the second will focus on case studies of key labor movements after 1960 focused on labor organizing, community, collective bargaining, and the growing diversity within Latinx working-class communities. Race, class, gender, ethnicity, and immigration status will be discussed.
Also offered for graduate-level credit as Hst 571 and may be taken only once for credit. Prerequisite: Upper-division standing. Cross-Listed as: This is the same course as ChLa 471 and may be taken only once forcredit.

## Hst 477 - Topics in Russian-Soviet History (4)

Studies selected themes on the political, social, and cultural as pects of the Imperial, Soviet, and/or post-Soviet experience. Investigates the politics, controversies, and socialimaginaries of the period and theme under study through primary sources and historiographical
debates. Course may be repeated for credit with different topics.
Also offered for graduate-level credit as Hst 577. Prerequisite: Upper division standing.

## Hst 478 - Topics in Russian Cultural-Intellectual History (4)

Studies selected cultural and intellectual trends in Imperial, Soviet, and/or post-Soviet Russia. Investigates themes related to modernity and mass culture, such as the formation of the intelligentsia, revolutionary ideologies, and/or Soviet Marxism, through the analysis of primary sources and historiographical debates. Maximum number of credits is 12; 4 credits each for three courses with different topics.
Also offered for graduate-level credit as Hst 578.
Prerequisite: Upper division standing.

## Hst 484 - Topics in Middle Fastern History (4)

Explores such transnational topics in the his tory of the Middle East as Is lamand modernity, the Middle East and the world economy, the Middle East and orientalism. Maximum number of credits is $12 ; 4$ credits each for three courses with different topics. Expected preparation: upperdivision standing.
Also offered for graduate-level credit as Hst 584. .

## Hst 486 - Modern Turkey (4)

A study of the formation and evolution of the Turkish Republic. Coverage runs fromthe late-Ottoman legacy (19th century) to an overview of the republican period (since 1923). Discussion of authoritarianismand democratization, religion and secularism, nationalis mand minorities, migration and urbanization, and relations with Europe and America. Expected preparation: upperdivision standing.
Also offered for graduate-level credit as Hst 586 and may be taken only once for credit. .

## Hst 488 - Modern Arabia (4)

A survey of the history of the Arabian Peninsula in the 19th and 20th centuries. Emphas is will be on socioeconomic and governmental institutional change with discussion of changing cultural values. The role of the British and Ottoman empires, Is lamic reformism, oil, and the emergence of nation states (Saudi Arabia, Yemen, Oman, and the Gulf States). Expected preparation: Upperdivision standing.
Also offered for graduate-level credit as Hst 588 and may be taken only once for credit. .

## Hst 490 - Comparative World History (4)

Comparative examination of important themes in world history. Both the themes and regional focus vary each
term, and themes may be drawn fromany time period. Maximum number of credits is $12: 4$ credits each for three courses with different topics.
Also offered for graduate-level credit as Hst 590. Prerequisite: Upper-division standing.

## Hst 491 - Reading Seminar (4)

Provides students with an overview of the scholarship in a specific his torical field. The course requires students to read, review, and discuss the significant books and articles in the field. This course is the prerequisite for Hst 492 Research Seminar.
Also offered for graduate-level credit as Hst 591.

## Hst 492 - Res earch Seminar (4)

Students will produce a research paper on a specific historical topic.
Also offered for graduate-level credit as Hst 592.

## Hst 493 - Introduction to Public History (4)

Introduction to the field of public history with special emphas is on research methods, procedures, and work in the practice of public history, fromarchival management to historic preservation and museumstudies.
Also offered for graduate-level credit as Hst 593 and may be taken only once for credit. . Prerequisite: Upperdivision standing.

## Hst 494 - Public History Seminar (4)

Engages students in advanced investigation of special topics in public his tory work, including archives, oral history, project design, digitalhistory, and others. Seminars feature technical readings, group work, peer evaluation, and written projects.
Also offered for graduate-level credit as Hst 594. . Prerequis ite: Upper-division standing.

## Hst 495 - Public History Lab (4)

Lab course will focus on a specific sub-field in Public History. Working professionals will instruct students in latest techniques used in public his tory work.
Also offered for graduate-level credit as Hst 595.

## Hst 496 - Introduction to Public History (4)

An introduction to the field of public history with special emphas is on the research methods, procedures, and work in the practice of public history, fromarchival management to historic preservation and museumstudies. Taught in cooperation with the professional staff of the Oregon Historical Society. This course is a prerequisite for Hst 404/504, Public History Internships.

## Hst 497 - Film and History (4)

The study of selected topics of modern history through the viewing and analysis of important documentaries and feature films. Emphasis is on the application of techniques of historical source criticism to the varied information preserved and transmitted in cinematographic form. The subject matter will vary from term to term. (Maximum number of credits is $12 ; 4$ credits each for threecourses with different topics.) Expected preparation: upper division standing.

Also offered for graduate-level credit as Hst 597. .
Hst 500 - Introduction to the Master's Programin History (4)
An introduction to the professional study of history and to the writing of the master's thesis. Intended for new or recently entering graduate students in history.

## Hst 501 - Research (0-9)

See department for course description. (Credit to be arranged.) Consent of instructor.

## Hst 502 - Independent Study (1-9)

(Credit to be arranged.)

## Hst 503 - Thesis (0-9)

See department for course description. (Credit to be arranged.)

## Hst 504 -Public History Internship(1-12)

Intensive, on-the-job internships with public agencies, private businesses, non-profit firms, and other groups in public history work. Each internship is by special arrangement and terms.
Also offered for undergraduate-levelcredit as Hst404..

## Hst 505 - Reading and Conference (0-8)

(Credit to be arranged.)

## Hst 506 -Problems/Projects (1-6)

(Credit to be arranged.)

## Hst 507 -Seminar (1-6)

Study and application of the techniques of historical research and writing.

Also offered for undergraduate-level credit as Hst 407. .

## Hst 510 - Selected Topics (1-6)

See department for course description. (Credit to be arranged)

## Hst 511 - Public History Lab (4)

Lab course will focus on a specific sub-field in Public History. Working professionals will instruct students in the latest techniques used in public his tory work. One lab course is required for graduate students taking the public history track in the M.A. in his tory.
Prerequis ite: Hst 496 or Hst 596.

## Hst 512 - Topics in African History and Culture (4)

An in-depthexploration of selected topics in African cultural history. Special attention will be given to thematic is sues of broad application to the understanding of cultural interaction, continuity, and change. The subject matter will vary from term to term. (Maximum number of credits is 12; 4 credits each for three courses with different topics.)

Also offered for undergraduate-level credit as Hst412. .

## Hst 513 - Topics in Transnationalism (4)

Examines human activities, institutional structures, and social movements that cross national boundaries. Topics include migration, diaspora, and activism, as well as flow of ideas, goods, and technologies among people or regions not defined primarily by the nation-state. Frameworks for study include border zones, deterritorialized nations or peoples, and global citizenship.
Also offered for undergraduate-level credit as Hst413.

## Hst 514 - Graduate Research Colloquium (1)

Provides an opportunity for graduate students in history to engage in presentation and discussion of each other's work under faculty guidance and to gain exposure to current developments in his torical scholarship through presentations of faculty research. May be repeated for credit; however, only a maximum of three credits may be applied to graduate degree requirements. Expected preparation: matriculation in graduate programin History.

## Hst 515 - Topics in Greek History (4)

An advanced look at specific topics in Greek history from the Bronze Age to the death of Cleopatra. Topics will include social, political, economic, intellectual, and religious history. The subject matter will vary fromterm to term. (Maximum number of credits is 12; 4 credits each for three courses with different topics.)
Also offered for undergraduate-level credit as Hst415.

## Hst 516 - Topics in Roman History (4)

An advanced look at specific topics in Roman history from the Etruscans to the Dark Ages. Topics will include social, political, economic, and intellectual his tory. Thesubject matter will vary fromterm to term. (Maximum number of credits is $12 ; 4$ credits each for three courses with different topics.)
Also offered for undergraduate-levelcredit as Hst416.
Hst 520 - Topics in Early Modern Japanese History (4)
Selected themes in Tokugawa (1600-1850) history, including rural life and urbanization, merchants and commerce, political thought and institutions, women and family life, neo-Confucianism, religious beliefs and practices, popular culture, arts, and literature. (Maximum number of credits is $12 ; 4$ credits each for threecourses with different topics.)
Also offered for undergraduate-levelcredit as Hst 420.

## Hst 521 - Topics in Modern Japanese History (4)

Selected themes in modern Japanese history, including the construction of the nation-state, modernization, Japan's drive to great power status, Japan's emergence as an imperialist power, state-society relations, and modernity outsideEurope. (Maximum number of credits is 12; 4 credits each for three courses with different topics.)
Also offered for undergraduate-level credit as Hst 421.
Hst 522 - Topics in Postwar Japanese History, 1945present (4)

Selected themes in postwar Japanese his tory, including the Occupation reforms (1945-52) and Japan's place in the Cold War system, the so-called "economic miracle," the development of a mas s consumer culture, and U.S.-Japan relations. (Maximum number of credits is 12; 4 credits each for three courses with different topics.)
Also offered for undergraduate-levelcredit as Hst 422.

## Hst 523 - Topics in Chinese Social History (4)

This course will examine institutions and themes-relating to the family, urban and rural life, education and the like-in Chinese social history. The subject matter will vary from term to term. (Maximum number of credits is 12; 4 credits each for three courses with different topics.)

Also offered for undergraduate-levelcredit as Hst423.

## Hst 524 -Topics in Chinese Thought and Religion (4)

Study of selected topics in intellectual and culturalhistory related to Confucianism, Buddhism, Daoism, and other philosophical and religious constructs. The subject matter will vary fromterm to term. (Maximum number of credits is 12; 4 credits each for three courses with different topics.)

## Hst 525 - Modern China (4)

History of China from decline of imperial systemthrough century of revolution that culminated in founding of People's Republic of China in 1949. Post-1949 focus on critical periods and is sues in state-society relations, economic and political reform, and cultural changes, including global posture and relations with the West.
Also offered for undergraduate-level credit as Hst 425.

## Hst 527 - Topics in the History of Science (4)

An in-depth investigation of a selected theme in the history of science and its cultural, social, or political relations. The subject matter will vary from term to term; topics include: science and religion, science under Nazism, science and Modernism, Darwinismand socialDarwinism, Scientific Revolution, and changing physical world pictures. Some previous study in his tory is recommended; a background in science is welcome, but not required or expected.
(Maximum number of credits is 12; 4 credits each for three courses with differenttopics.)

Also offered for undergraduate-level credit as Hst427..

## Hst 529 - Topics in U.S. Cultural History (4)

A lecture course that explores selected topics in modern U.S. political culture and cultural expres sion. Maximum number of credits is $12 ; 4$ credits each for three courses with different topics.
Also offered for undergraduate-level credit as Hst429..

## Hst 530 - Roots of American Culture (4)

Relation of cultural attitudes and values to the American historical experience from 1600-1860. Topics include the European legacy; Puritanis m; race, class, and ethnicity; American Enlightenment and Revolution; Cultural Nationalis m; Industrial Ethic and Pastoralism; Jacksonian Democracy; Manifest Destiny and Native Americans; Slavery and African American Culture; Evangelicalism, Reform, Abolitionism, and Feminism.

Also offered for undergraduate-level credit as Hst430 and may be taken only once for credit.

## Hst 531 - Rise of American Corporate Culture (4)

Relation of cultural attitudes and values to the American historical experience from 1860-1945. Topics include Civil W ar and Reconstruction; Incorporation, Labor Reform, and Utopian Thought; Populism; Progressive Reform; Two Cultures of the 1920s; Depression Realismand Radicalism; World W ar II and the Judeo-Christian Consensus.
Also offered for undergraduate-level credit as Hst431 and may be taken only once for credit.

## Hst 532 - Recent U.S. Political Culture (4)

Relation of cultural attitudes and values to the American his torical experience from 1945 to the present. Topics include Anti-Communist, Nationalist, and Anticorporate Insurgence in the 1950s; Antiwar, Racial, Counterculture, and Feminist Ferment in the Protest Era; New Age and Postmodernist Thought; Populist Conservatis mand Traditional Values, 1980-present.
Also offered for undergraduate-level credit as Hst432 and may be taken only once for credit.

## Hst 533 - American Social and Intellectual History, 1600-1865 (4)

Examines early history of American social and intellectual his tory, including is sues of race, class, religion and philosophy, ideology and politics, community, region, and labor.

Also offered for undergraduate-levelcredit as Hst433 and may be taken only once for credit.

## Hst 534 -U.S. Social and Intellectual History, 1865present (4)

Examines social and intellectual his tory of the United States from 1865 to the present. Includes discussion of race, class, religion and philosophy, ideology and politics, community, region, and labor.

Also offered for undergraduate-levelcredit as Hst434 and may be taken only once for credit.

## Hst 538 - American Economic History: the First Century (4)

The economic background of the W ar of Independence and the seeds of the Civil War. Industrialization, urbanization, and development of the frontier. Rise of big business and org anized labor. Laissezfaire, federalism, and the gradual emergence of the national government in economic policy. Changes in foreign trade and in the international position of the U.S.

Also offered for undergraduate-levelcredit as Hst438 and may be taken only once for credit. .

Hst 539 - American Economic History: the 20th Century (4)
Economic impact of U.S. involvement in W orld W ar I. Postwar structuralchanges. Waning of laissezfaire. Causes of the Great Depres sion. Economic policies of Hoover and Roosevelt adminis trations. The New Deal reforms. World War II and emergence of the administered system. Evolution of the mixed economy and growing role of the government. The industrial-military complex and the social imbalance.

Also offered for undergraduate-levelcredit as Hst439 and may be taken only once for credit. .

## Hst 540 - American Environmental History (4)

A survey of North American history that explores the relationships between ideas of nature, transformations of the environment, and the effect of the environment on humans. Topics include colonialis m; links between ecological change and race, class, and gender relations; the role of science/technology; agriculture, industrialization, and urbanization; and environmentalism.
Also offered for undergraduate-level credit as Hst440 and may be taken only once for credit.

## Hst 542 - Race, Class and Gender in the American West (4)

Examines the trans-Mis sissippiWest as a cultural meeting ground and explores the racial, class, and gender implications of new migrations to the region. Particular attention will be placed on the arid West and human responses to landscape.
Also offered for undergraduate-level credit as Hst442 and may be taken only once for credit. .

## Hst 543 - The American West: A Political and Economic History (4)

Focuses on the major political and economic changes in the trans-Mississippi West, from the 17th century to the late 20th century, with special attention to the increasing power and influence of the federal government and corporate institutions after 1870. Recommended prerequisite: upper division standing.

## Hst 544 - History of the Pacific Northwest (4)

The social, cultural, economic, and political as pects of the development of civilization in Oregon and Washington. The history of the region is related to national and international contexts.
Also offered for undergraduate-level credit as Hst 444 and may be taken only once for credit. .

## Hst 545 - History of Portland (4)

The historical growth of Portland and its metropolitan region, with major attention given to the 20th century. Emphasis is placed upon the process of urbanization and the consequences of the past decisions and actions as they relate to recent developments.
Also offered for undergraduate-level credit as Hst445 and may be taken only once for credit. .

## Hst 546 - Civil Rights and the Law: The History of Equal Protection (4)

An exploration of the history of the 14th Amendment Equal Protection Clause's impact on the civil rights of

Women, African Americans, Mexican Americans, and others.

Prerequisite: upper-division standing.

## Hst 547 - U.S Constitutional History: Foundations (4)

Examines the intellectual origins, creation, and ratification of the American Constitution and the early efforts of the U.S. Supreme Court to construe that document.

Also offered for undergraduate-level credit as Hst447 and may be taken only once for credit.

## Hst 548 - U.S. Constitution: Nineteenth Century (4)

Examines the U.S. Supreme Court's role in the construction of modern America; includes discussion of the Court's decisions on federalism, slavery, presidential war powers, Reconstruction and civil rights, and industrialization.

Also offered for undergraduate-level credit as Hst448 and may be taken only once for credit.

## Hst 549 - U.S. Constitution: Twentieth Century (4)

Examines how the U. S. Supreme Court's decisions in the twentieth century impacted the national economy, federalis $m$, and the civil rights and civilliberties of American citizens.

Also offered for undergraduate-level credit as Hst449 and may be taken only once forcredit.

## Hst 550 - Medieval England (4)

Examines political, religious, social, and economic as pects of the history of Eng land from approximately 800 to the end of the 14th century.
Also offered for undergraduate-levelcredit as Hst450 and may be taken only once for credit.

## Hst 551 - Early Modern England (4)

Examines political, religious, social, and economic as pects of the history of England from the 15th through the 17th centuries.

Also offered for undergraduate-levelcredit as Hst451 and may be taken only once for credit. .
Hst 552 - Topics in the History of European Women (4)
Examines selected aspects of the his tory of European women, focusing on one or more specific regions, topics, and/or time frames. Possible topics include aspects of the history of women and religion, women and work, women acces sing power, and gender and religious identity. Maximum number of credits is 12; 4 credits each for three courses with different topics.
Also offered for undergraduate-level credit as Hst 452. .

## Hst 553 - The Medieval City: Communities of Conflict and Consensus (4)

Emphasizes the social and cultural history of the medieval city from ca. 300-1500. Proceeding chronologically and thematically, explores how contemporaries imagined cities and urban life; the formation of civic consciousness and identity in feudalEurope; the commercial revolution and its cultural consequences; family and domestic life; the experience of marginalized elements; the construction, regulation, and function of urb an space; and the role of spectacle, ceremony, and ritual, all as means to assess how the urban community mediated conflict and sought elusive consensus.
Also offered for undergraduate-level credit as Hst453 and may be taken only once for credit. .

## Hst 554 - Topics in Medieval History (4)

Examines selected topics in the social, cultural, and /or religious history of the European Middle Ages, spanning the period fromroughly 300-1450 C.E. Topics will vary, but may include the study of sanctity and society, relig ious dissent and reformation of the church, holy war and crus ade, regional and national political his tories, crosscultural studies, and other subjects. (Maximumnumber of credits is $12 ; 4$ credits each for three courses with different topics.)
Also offered for undergraduate-level credit as Hst454..

## Hst 555 - Topics in Renaissance History (4)

Identifies and examines those special aspects of W estern European civilization that mature roughly between 1300 and 1550 and that begin to set it apart fromthe medieval era. Not a survey of life during a period of time but a study of selected phenomena. Topics include the revival of antique (above all Latin and Greek) letters and attitudes, types of Humanism, new education ideals, secular outlook, the functions of Renaissance patrons, political theory and the growth of the "early modern state," Neoplatonism, and the spread of the Renaissance fromItaly to Northern Europe. (Maximum number of credits is 12; 4 credits each for three courses with different topics.)

Also offered for undergraduate-level credit as Hst 455..

## Hst 556 - Religious Change in Sixteenth Century Europe (4)

Examines the causes, characteristics, and consequences of the revolutionary changes in European Christianity that occurred during the 16th century: changes that are generally labeled "The Reformation."

## Hst 557 - Topics in Early Modern Europe (4)

Examines selected topics in the social, cultural, political and/oreconomic history of Europe in the early modern
period (roughly 1515-1815). Topics will vary, but may include European financial history, the cris is of the seventeenth century, popular revolt, the royal state, and other topics. May be taken a second time for credit (maximum 8 credits) with a different topic.
Also offered for undergraduate-levelcredit as Hst457. .
Hst 558 - Modern Germany (4)
Examines aspects of the development of German political, social, and cultural life during the 19th and 20th centuries. Expected preparation: graduatestanding.

Also offered for undergraduate-level credit as Hst458 and may be taken only once for credit. .

## Hst 559 - Topics in Modern European History (4)

Examines a selected theme related to the history of modem Europe from (primarily) the 19th through the 20th centuries. Topics will vary, whether focusing internationally or on a single European nation, but will include the definition of Europe; dictatorship and sovereignty; nationalismand identity; society and the state; the experience of modern violence; trials and justice; world wars; comparative fascis $m$; social and political transition, and war and society. May be taken a second time for credit (maximum 8 credits) with a different topic. Expected preparation: Graduatestanding.
Also offered for undergraduate-levelcredit as Hst459..

## Hst 560 - Topics in European Intellectual History (4)

Examines a selected theme in the development of European thought in its social context; format includes lecture and the analysis and dis cussion of primary texts. May be taken a second time for credit (maximum 8 credits) with a different topic. Expected preparation: graduate standing for 560.
Also offered for undergraduate-level credit as Hst 460 and may be taken only once for credit. .

## Hst 561 - Topics in Jewish History (4)

Examines select aspects of Jewish history, focusing on one or more specific regions, periods, events, or concerns. Possible topics include: medieval and early modern Jewish history, ancient Is raelite or rabbinic history and culture, Sephardic Jewry, his tory of Rus sian Jewry, and gender and Jewish history. Maximumnumber of credits is 12; 4 credits each for three courses with different topics.
Also offered for undergraduate-levelcredit as Hst461..

## Hst 564 - Indians of the Pacific Northwest (4)

Explores the history of peoples native to the Pacific Northwest with a specialemphasis on natural resource allocation and the relationships between federal, state, and tribal governments in the 19th and 20th centuries.

Also offered for undergraduate-level credit as Hst464 and may be taken only once for credit. .

## Hst 565 - Twentieth Century Latin America (4)

Course examines: Positivism, Mexican Revolution, World WarI, import substitution, comparison of Argentina, Mexico, Brazil and Peru in the 1920s, the Depression in Latin America, Nazi threats, U.S. Latin American cooperation WWII, the Cold War, Cuba as watershed, Alliance for Progress, Liberation theology, Soviet, Cuban, Chinese, Trotzky ite rivalries, Dirty wars, Central American revolutions, implosion of Mexican development model, democracy, rise of digital worlds, stimulants, tourism, Nafta, U.S. disregard.
Also offered for undergraduate-level credit as Hst465 and may be taken only once for credit. .
Hst 568 - History of Mexico I: 4000 BCE-1821 (4)
Study of Mexico's beginnings frompre-Columbian times through the colonial period. The origins of Mexican culture, society, economy, and political institutions will be examined in the context of His panic and indigenous contributions.
Also offered for undergraduate-level credit as Hst468 and may be taken only once for credit. .

## Hst 569 - History of Mexico II: 1810-1876 (4)

Study of Mexico's history fromthe revolutions for independence until 1876. Emphasis will be placed upon the development of constitutional government, the era of reform, foreign interventions, and the restoration of the republic.
Also offered for undergraduate-level credit as Hst469 and may be taken only once for credit. .

## Hst 570 - History of Mexico III: 1876-Present (4)

Mexico's emergence as a modern nation during the Porfirian dictatorship. The 20th century revolutionary upheaval and consolidation.

Also offered for undergraduate-level credit as Hst470 and may be taken only once for credit. .

## Hst 571 - Chicanx Labor History in the USA (4)

A study of the development and growth of Chicanx labor movements in the 20th century. The first part of the course will focus on movements prior to 1960, and the second will focus on case studies of key labor movements after 1960 focused on labor organizing, community, collective bargaining, and the growing diversity within Latinx working-class communities. Race, class, gender, ethnicity, and immigration status will be discussed.
Also offered for undergraduate-level credit as ChLa 471 and Hst 471 and may be taken only once for credit.

## Hst 577 - Topics in Russian-Soviet History (4)

Studies selected themes on the political, social, and cultural aspects of the Imperial, Soviet, and/or post-Soviet experience. Investigates the politics, controversies, and social imaginaries of the period and theme under study through primary sources and historiographical debates. Maximum number of credits is $12 ; 4$ credits each for three courses with different topics.
Also offered for undergraduate-levelcredit as Hst477. .

## Hst 578 - Topics in Russian Cultural-Intellectual History (4)

Studies selected cultural and intellectual trends in Imperial, Soviet, and/or post-Soviet Russia. Investig ates themes related to modernity and mass culture, such as the formation of the intelligentsia, revolutionary ideologies, and/or Soviet Marxism, through the analy sis of primary sources and historiographical debates. Maximum number of credits is 12; 4 credits each for three courses with different topics.

Also offered for undergraduate-levelcredit as Hst478.

## Hst 584 - Topics in Middle Eastern History (4)

Explores such transnational topics in the history of the Middle East as Is lamand modernity, the Middle Eas tand the world economy, the Middle East and orientalism. Maximum number of credits is $12 ; 4$ credits each for three courses with different topics.
Also offered for undergraduate-levelcredit as Hst484. .

## Hst 586 - Modern Turkey (4)

A study of the formation and evolution of the Turkish Republic. Coverage runs fromthe late-Ottoman legacy (19th century) to an overview of the republican period (since 1923). Discussion of authoritarianismand democratization, religion and secularism, nationalis mand minorities, migration and urbanization, and relations with Europe and America.

Also offered for undergraduate-levelcredit as Hst486 and may be taken only once for credit. .

## Hst 588 - Modern Arabia (4)

A survey of the history of the Arabian Peninsula in the 19th and 20th centuries. Emph as is will be on socioeconomic and governmental institutional change with discussion of changing cultural values. The role of the British and Ottoman empires, Is lamic reformism, oil, and the emergence of nation states (Saudi Arabia, Yemen, Oman, and the Gulf States).
Also offered for undergraduate-levelcredit as Hst488 and may be taken only once for credit. .

## Hst 590 - Comparative World History (4)

Comparative examination of important themes in world history. Both the themes and regional focus vary each term, and themes may be drawn fromany time period. Maximum number of credits is 12: 4 credits each for three courses with different topics. Graduate credit requires a substantial research paper.

Also offered for undergraduate-level credit as Hst490.

## Hst 591 - Reading Seminar (4)

Provides students with an overview of the scholarship in a specific historical field. The course requires students to read, review, and discuss the significant books and articles in the field. This course is the prerequisite for Hst 592 Research Seminar.

Also offered for undergraduate-level credit as Hst491. Prerequis ite: Graduate standing.

## Hst 592 - Res earch Seminar (4)

Students will produce a research paper on a specific historical topic.

Also offered for undergraduate-level credit as Hst492.

## Hst 593 - Introduction to Public History (4)

Introduction to the field of public his tory with special emphas is on research methods, procedures, and work in the practice of public history, from archival management to historic preservation and museumstudies.
Also offered for undergraduate-level credit as Hst493 and may be taken only once for credit.

## Hst 594 - Public History Seminar (4)

Engages students in advanced investigation of special topics in public his tory work, including archives, oral history, project design, digitalhistory, and others.
Seminars feature technical readings, group work, peer evaluation, and written projects. Required for graduate students taking the public history track option as Hst 594.

Also offered for undergraduate-level credit as Hst494. .

## Hst 595 - Public History Lab (4)

Lab course will focus on a specific sub-field in Public History. Working professionals will instruct students in latest techniques used in public his tory work.

Also offered for undergraduate-level credit as Hst495.
Hst 596 - Introduction to Public History (4)
An introduction to the field of public history with special emphas is on the research methods, procedures, and work in the practice of public history, fromarchival management to historic preservation and museumstudies. Taught in cooperation with the professional staff of the Oregon

Historical Society. This course is a prerequisite for Hst 404/504, Public History Internships.

## Hst 597 -Film and History (4)

The study of selected topics of modern history through the viewing and analysis of important documentaries and feature films. Emphas is is on the application of techniques of his torical source criticism to the varied information preserved and transmitted in cinematographic form. The subject matter will vary from term to term. (Maximum number of credits is $12 ; 4$ credits each for threecourses with different topics.)
Also offered for undergraduate-levelcredit as Hst497..
Hum - Humanities
Hum 199 - Special Studies (1-4)
(Credit to be arranged.)

Hum 299 - Special Studies (1-4)
(Credit to be arranged.)

Hum 399 - Special Studies (1-6)
(Credit to be arranged.)

## Hum 405-Reading and Conference (1-6)

(Credit to be arranged.)

Hum 407 - Seminar (1-6)
(Credit to be arranged.)

## Hum 410 - Selected Topics (1-6)

(Credit to be arranged.)

## IELP - Intensive English Language Program

## IELP 101 -Pre-Entry ProgramGrammar/Writing (8)

An introduction toform, meaning and use of simple present and past verb tenses; conjunctions; subject, object, possessive, and demonstrative pronouns. Students will learn to identify parts of speech and sentences; question/answer formation; write beginning level paragraphs; understand and use the basic rules for
capitalization, punctuation and spelling; practice good penmanship.

## IELP 104 - Pre-Entry Program Reading (6)

An introduction to basic reading skills including phonics, basic comprehension, fluency, sequence, word analysis; finding the topic. Introduction to basic dictionary skills and extensive reading. Emphasis on building vocabulary and decoding strategies to aid in fluency and reading forbasic understanding.

## IELP 106 - Pre-Entry ProgramSpeaking/Listening (4)

An introduction to basic listening and speaking skills. Practice with listening to conversations and interviews; asking/answering questions; making positive and negative statements in the present tenses; describing people, places, things and activities; giving personal information, express-ing wants, needs and likes. Emphas is is on pro-nunciation and understanding and being under-stood in simple conversational situations.

## IELP 111 - Grammar/Writing Level 1 (8)

Continued focus on sentencestructure and developing basic sing le paragraphs (descriptive and narrative rhetorical styles) with topic, supporting, and concluding sentences. Introduction to compound and complex sentences. A continued focus on simple present and past verbs, and an introduction to form, meaning, and useof progressive and future tense, including statement and question forms; contractions; time expressions; modals; count/noncount nouns; pronouns; adjective and noun complements; demonstratives; and prepositions.

## IELP 114 - Reading Level 1 (4)

Continued focus on basic reading skills, as well as introduction to skimming and scanning, differentiating main ideas from supporting details and examples, identifying common prefixes and suffixes, discerning meaning from context, and matching pronouns to their referents. Dictionary exercises used to practice alphabetical order, s yllabification, and word stress. Continued emphasis on building vocabulary and honing skills through reading short, adapted materials.

## IELP 116 - Speaking/Listening Level 1 (4)

Continuedemphasis is on developing confidence, comprehensibility, and skills in basic social interactions, including participating in conversations, as king for information, and providing personal information. Practice
questions, statements, and negatives in present, past, and future tenses; identify common reductions, stress, and intonation patterns; use vocabulary related to academic and everyday life; give narrative and descriptive individual presentations.

## IELP 121 -Grammar/Writing Level 2 (lowintermediate) (8)

Focus on paragraph development and introduction to process, comparis on/contrast, and classification writing as rhetorical styles; use of logical connectors; outlining ideas for essay organization; and formatting rules. Emphas is on expanding single paragraph es says into longer essays. Expanded utilization of modal auxiliaries and introduction to present perfect tense, gerunds and infinitives, passive voice, real conditional, comparative and superlative adjectives, and adverbs.

## IELP 124 - Reading Level 2 (low-intermediate) (4)

Focus, in both fiction and non-fictiontexts, on improving comprehension skills; locating and understanding main ideas, supporting details, and signal words; inferring meaning; and increasing reading speed. Improve dictionary skills and expand academic vocabulary knowledge including meaning, parts of speech, affixes, and word forms.

## IELP 126 -Speaking/Listening Level 2 (lowintermediate) (4)

Identify meaningful information fromshort lectures and conversations; practice with question forms in present, past, future, and present perfect tenses; conduct interviews; plan and deliver short oral presentations. Continued improvement of pronunciation skills, including stress, intonation, and reductions.

## IELP 131 - Grammar/Writing Level 3 (intermediate) (8)

Introduction to cause/effect and argumentation as rhetorical styles; practice narrowing a topic, de veloping more effective introductions and conclusions; use of transitions to subordinate/coordinate ideas. Emphas is on essay writing. Expanded use of gerunds and infinitives, modal auxiliaries, and adverbial clauses. Introduction to past perfect and future perfect tenses, subordinate clauses, parallel structure, and relativeclauses.

## IELP 134 - Reading Level 3 (intermediate) (4)

Focus on developing critical reading skills in expanded works of fiction and non-fiction; introduction to rhetorical patterns, distinguishing fact fromopinion, determining author's purpose, paraphrasing and summarizing points, and identifying elements of fiction. Expansion and use of academic vocabulary.

## IELP 136 -Speaking/Listening Level 3 (intermediate) (4)

Emphasis on taking organized notes using symbols and abbreviations, understanding main ideas and examples, and identifying lecture cues fromacademic lectures. Improve skills needed for focused small group discussions, impromptu speaking, and individual and group presentations using information gathered frominterviews.

## IELP 142 - Advanced English Grammar for Non-native Speakers (4)

Focus on grammar concepts that are essential for effective academic writing. Students will apply these concepts in written activities and begin to learn self-editing techniques. Students should have a basic foundation in English grammar including the English verb tense systemand simple, compound and complexsentence structures.

## IELP 143 - Guided Research Writing for Non-native Speakers (4)

Students produce academic research papers using sources provided by the instructor. Skills include developing ideas for writing, using transitional elements, paraphrasing and documenting sources, and developing effective thesis statements, introductions and conclusions. Analysis and synthesis of information fromsources for use in writing. Students must have a bas ic foundation in academic writing in order to enroll in this course.

## IELP 144 - Academic Reading for Non-native Speakers (4)

Students improve ability to read academic texts quickly and effectively. Concepts taught include considering the author's point of view and purpose in understanding a reading, developing strategies for answering essay questions under time constraints and learning how to paraphrase, summarize and respond to readings. Students will also build their academic vocabulary during the term. Students should have a basic foundation in academic reading in order to enroll in the course.

## IELP 147 - Understanding Academic Lectures (4)

Students prepare for the demands of understanding academic lectures in university contexts. Focus in on developing skills and strateg ies to increase effective lecture listening, note-taking, and retrieval and application of information.

## IELP 152 - Grammar and Editing for Academic Writing for Non-native Speakers (4)

Students identify and integrate the grammatical structures that can cause difficulty in writing for non-native speakers. These structures include conditionals, prepositions, and subordination, among others. Students will focus on using grammar effectively in self-editing of academic writing. Students must have a strong foundation in English grammar in order to enroll in this course.

## IELP 153 - Independent Research Writing for Nonnative Speakers (4)

Students write a research paper based on a topic of their choosing. Focus on critical thinking skills, finding appropriate sources through library and internet searches, and synthesis of ideas fromsources into a well developed, clearly organized and accurately documented paper. Students taking the course should have experience writing basic source-based essays with a thesis and documentation.

## IELP 154 - Advanced Academic Reading for Nonnative Speakers (4)

Students expand ability to efficiently and effectively read academic texts. Students lead group discussions on academic articles and continue building on academic vocabulary. Summary and response writing focuses on using critical thinking skills. Students should have a strong foundation in academic reading in order to enroll in the course.

## IELP 155 -Discussion Skills for Non-native Speakers (4)

Focus on communication skills within the context of small group settings. Development of effective group collaboration and communication strategies including oral expression, active lis tening, dis cussion roles, and cultural competency. Students practice skills through participation in group projects.

## IELP 156 - Public Speaking for Non-native Speakers (4)

Students learn techniques for developing and delivering both impromptu and prepared speeches. Emph as is will be given to developing strategies to reduce nervousness, org anize ideas, produce grammatically accurate language and improve pronunciation and overall oralquality.

## IELP 170 -Skills Enhancement (1-12)

A variety of classes aimed at learning English in a variety of manners, ie. English through Drama, Pronunciation, Vocabulary Building, just to name a few. Course selection varies on a quarterly basis.

## IELP 171 - Pathways Introduction Seminar (2)

Supports students' personal growth and academic transition fromESL course work to university course work. Students learn about university resources, policies, procedures, and expectations governing their degree study. Students engage in individualized academic activities and planning by making informed decisions and creating a oneyear academic plan.
Prerequisite: (IELP 131, IELP 134, and IELP 136) or placement into IELP 142, IELP 143, IELP 144, IELP147 or higher.

## IELP 172 - Pathways Intermediate Seminar (2)

Supports students in level5 IELP classes as they take their first academic courses at PSU. The course focuses on transferring academic skills used in language-learning clas srooms to content-specific academic clas srooms. The work that students are doing in their IELP and PSU courses are thebasis of mostclas sroomactivities. Students evaluate and update their academic plans in consultation with their academic advisor in their major, strengthening their connection to their academic departments.

Prerequisite: IELP 142, IELP 143, IELP 144, IELP 147, and IELP 171.

## IELP 173 - Pathways Final Seminar (2)

Concludes students' preparation for full-time academic study in their next term. The focus of this course is academic literacy and goal development. Students link academic course work, co-curricular and extra-curricular opportunities, and career development as part of independently directing their academic planning.

Prerequisite: IELP 142, IELP 143, IELP 144, IELP 147, and IELP 171.

IELP 199 -Special Studies (1-12)
(Credit to be arranged.)

IELP 199L- Lab for IELP 199 (0)
Lab for IELP 199L.

## IELP 399 -Special Studies (1-8)

(Credit to be arranged.)

## IELP 453 -Graduate Preparation: Research and Writing for Non-Native Speakers (4)

Students refine their academic writing skills through research and citation. The course als o focuses on recognizing and producing vocabulary and grammar appropriate to graduate-level writing
Prerequisite: Upper-division standing and IELP program approval.

## IELP 454 - Graduate Preparation: Reading Strategies for Non-Native Speakers (4)

In this hybrid course, students explore readings in their individual disciplines and develop a portfolio of academic skills and strategies to prepare for graduate-level reading. Students utilize technology to org anize and manage readings, cite sources, and expand academic vocabulary.

Prerequisite: Upper-division standing and IELP program approval.

## IELP 456 - Graduate Preparation: Oral Communication for Non-Native Speakers (4)

Students prepare for the demands of graduate-level coursework by activating their skills through public speaking and group discussion. Emphas is is also on expanding interpersonal language skills and cross-cultural skills in an academic environment.

Prerequisite: Upper-division standing and IELP program approval.

## IELP 457 - Writing Workshopfor Multilingual

 Graduate Students (2)The Graduate Writing Workshop is a 2 -credit course designed to support multilingual graduate students with their existing writing projects. Students should have an existing writing project or regular written assignments that they wish to receive guidance on. Through seminar-style discussions and peer workshops, students will develop a critical awareness of their own writing needs and the conventions of American academic writing.
Prerequisite: Graduate-student standing.

## Intl - International Studies

## Intl 195 - Colloquium (1)

Lectures by PSU and visiting scholars on major world is sues.

Intl 199 -Special Studies (1-9)
(Credit to be arranged.)

## Intl 201 - Introduction to International Studies (4)

A survey of the main concepts, analytical tools, fields of study, global problems, and cross-cultural pers pectives that comprise international studies.

## Intl 296 - The United States and the World (4)

Interdisciplinary study and analysis of the role of the United States in world affairs with emphas is on the twentieth and twenty-firstcentury, relations between the U.S. and the Third World, theera of the Cold War, American globalism, diplomatic, economic, and geopolitical issues.

Intl 299 - Special Studies (1-6)
(Credit to be arranged.)

## Intl 314U- The Global City in Film (4)

Critically examines urban social is sues reflected in films from different countries. Course includes in-class screening, lecture and dis cussion, and film review writing exercises. Topics for discussion include the urban form, is sues of race, gender and social class, the relationships among communities, political authority, industry, commerce, police, street gangs, criminals, public schools, and other institutions and denizens of the city.

Cross-Listed as: This is the same course as USP 314U and may be taken only once for credit.

## Intl 317U- Topics in Asian Thought (4)

Study of the religious and ethical traditions of Asia including, but not limited to, Buddhism, Confucianism, Hinduism, and Is lam, their social and culturalimportance, and their ties to politicalthought and his tory. Course may be repeated for cred it with different topics.

## Intl 321 U - Topics in Asian Identities and Globalization (4)

Examines how Asian societies define the meaning of globalization vis-a-vis themselves andeach other. Course may be repeated forcredit with different topics.

## Intl 323U- Topics in Asian Traditions and Innovations

 (4)Examines how Asian societies employ the meanings of "traditions" and "innovations" to define themselves and view each other. The course looks at traditions and innovations in Asia by drawing on interdisciplinary and multidisciplinary knowledge sources. Course may be repeated forcredit with different topics.

## Intl 325U - Contemporary India (4)

Focusing on 21st and 20th century India, the course introduces the country's development story and ongoing social and cultural transformations in a highly diverse society. The course will examine existing and emergent political and environmental challenges in one of the world's oldest and largest countries.

## Intl 331U - Women and the Middle Fast (4)

Aims to explore the role and status of women in the contemporary Middle East with respect to institutions such as the family, law, education, work, and politics --areas which intersectand overlap with broader cultural questions about women and their place in tradition, modernity, nation-building, Is lam, and the West.
Cross-Listed as: This is the same course as WS 331U and may be taken only once for credit.
Intl 332U - Islamic Social Movements (4)
An overview of recent Is lamic social movements. Examines the roots and development of Is lamic movements in, among others, Muslim-populated societies in the context of Social Movement Theory and globalization. Particularattention is given to the rise of Islamic socio-political movements fromtheir position as a local and regional force to a global social movement.

## Intl 341U - Environment and Development in Latin America (4)

Examines the interrelationships between environment and development in Latin America from an interdisciplinary perspective. Explores issues of sustainable development including agriculture, deforestation, trade, urbanization, ecotourismand migration.

Intl 342U- Globalization and Conflict in Latin America (4)

Examines issues of globalization and its impacts on regional conflict in contemporary Latin America. Topics include political systems, trade, poverty, inequality and human rights.

## Intl 343U-Commodity Chains in Latin America (4)

Explores the politics, economy, culture andenvironmentof Latin America from the point of view of export commodities. Tracing commodity chains, fromsilver and coffee to bananas and soy, the course shows how these chains connect specific locations in Latin American to the world economy.

## Intl 349U-Gender and International Development (4)

Examination of how gender mediates access to livelihoods, lived experiences of poverty, inequality, and other social power relations in developing countries. Analysis of critical development problems using a gendered lens and addressing urgent policy problems in developing countries. Understand how the social construction of gender and materiality of gendered lives impact the experiences of capitalist development in the Global South.
Cross-Listed as:This is the same course as WS 349U and may be taken only once for credit.

## Intl 350U- The City in Europe (4)

Focus on modern urban life since the eighteenth century and various res ponses to industrialization, state power, modernity, and globalization. The city provides a lens into debates on imperialis $m$, nationalis $m$, and cosmopolitanism. Through case studies, literature, and film, the course explores cities' roles in shaping European identity and citizenship.

## Intl 360U- Bollywood: Communicating Contemporary South Asia through Cinema (4)

Bollywood encompasses media industries in India and South A sia that produce entertainment for worldwide consumption. Weexamine transnational Indian Cinema emphasizing: Globalization and the politics of transnational film production, dis tribution, and reception. Local-regional-global dynamics. The construction and negotiation of gender, family, nation, religion/communalism, and emerging filmic genres. Filmic representation and diasporic identities.

## Intl 362U- Amazon Rain Forest (4)

Examines different ways in which the Amazon has been perceived through time. This course is the same as Hst 362 U ; course may only be taken once for credit.
Cross-Listed as: Hst 362U.

## Intl 364U- Modern Brazil (4)

Examines such topics as slavery, abolition, messianism, banditry, the Amazon, race, military rule, and democratization in the making of modern Brazil. This course is the same as Hst 364. May only be taken once for credit.

## Intl 365U - Digital Globalization (4)

Explores how digital globalization has impacted all aspects of global society. Examines three main areas: digital culture and the individual; the sharing economy and innovation; and security is sues, particularly questions of privacy and surveillance.

## Intl 366U- Cyberwar \& Espionage (4)

Examination of the use of cyberwarfare and es pionage in International Affairs as well as the ethical is sues entailed by these activities, and how these may be viewed differently by states, organizations and individuals. Also examines the theoretical foundations that underpin foreign policy debates related to cyberconflict and spying.

## Intl 367U- The Global Drug Trade (4)

Explores the nature of the global drug trade, and its impact on the environment, nation-states, economies, populations, and international relations. Also examines different perspectives to understanding the drug trade, such as the global health approach to drugs, and the arguments for legalization. Students will also examine how drugs have been securitized as an is sue, and the pros and cons of this approach. This class will place the drug trade in the context of other major global is sues, such as how the drug trade fuels migration.

## Intl 372U - Post-colonial Studies of Africa (4)

Study of the social, political, and economic dimensions of imperialism in twentieth century Africa fromthe perspective of post-colonial studies. This is the same course as BSt 372U and may be taken only once for credit.
Cross-Listed as: BSt 372U.

## Intl 375U - Global Migration (4)

Exploration of the relationship between globalization and labor migration, with an emphas is on understanding migration patterns at local and global scales, location of the migrant within the global political economy, and the differential experiences of migrants around the world.

## Intl 380U- Globalization, Representation and Difference in Media and Film (4)

Culture Industries such as television, film, social/digital media, community-based media, local press are global in reach and influence. We use international cultural artifacts to understand how globalization impacts the representation of difference commoditization of culture.

## Intl 391 U- Media and International Relations (4)

Examines the role of media (traditional and new media), historical and contemporary, in the conduct of international relations and in the reporting and representations of national and international politics and cultures.

## Intl 395 - Colloquium (1)

Lectures by PSU and visiting scholars on major world issues.

## Intl 397 - Theory and Policy in International Development (4)

Explores the concept of international development, its theoretical evolution and application in developing nations. Utilizes a his torical approach starting with colonialis mand ending with topics of contemporary salience such as trade, financial liberalization and sustainability.

Prerequisite:Intl 201 and Intl 296.
Intl 399 - Special Studies (0-12)
(Credit to be arranged.)

## Intl 401 - Research (1-12)

(Credit to be arranged.)

Intl 402 - Independent Study (1-8)
(Credit to be arranged.)

## Intl 404 -Cooperative Education/Internship (1-12)

(Credit to be arranged.)

## Intl 405 - Reading and Conference (1-12)

(Credit to be arranged.)

## Intl 407 -Seminar (4)

Reading and discussion about an interdisciplinary topic in international affairs. Restricted to upper-divisionstudents with an International Studies major or minor.

Prerequisite: Intl 397 or Intl 415.
Intl 410 -Selected Topics (1-12)
(Credit to be arranged.)

## Intl 415 -Global Studies Theories (4)

Exploration of key theories of global, social, and cultural processes including positivis $m$, liberalism, and Marxism through multiple approaches including non-Western and comparative perspectives.
Prerequisite:Int1 201 and Int1 296.

## Intl 445 -Cities and Third World Development (3)

Critical survey of historical, economic, cultural, political, and urban aspects of Third World development, starting with the colonial era. Includes historical patterns of integration of the Third World with the emerging world market system. Covers development theories and problems of the post-independence period, focusing on urban issues and policy alternatives. This is the same course as USP 445 and may be taken only once for credit.
Prerequisite: Upper-division standing. Cross-Listed as: USP 445.

## Intl 452 - The European Union (4)

Focuses on how the EU has evolved since its beginnings in the 1950s, on its present-day organization and functions, and on how the member countries interact in making EU policies for jointly regulating their internaleconomies and societies as well as how the EU members also try to manage their relations with the rest of the world. This course is the same as PS 452; course may only be taken once for credit.
Cross-Listed as:PS 452.
Intl 460 -Political Development in Modern Turkey (4)
Designed to provide students with an in-depth study of political development literature with a focus on modern Turkey. Examines how a modern Turkish republic
emerged from the ashes of the Ottoman Empire and evaluates stages of political development during the first, second, and third republic. Finally, assesses the implications of Turkey's new geopolitics (post Cold War) on Turkish political and economic developmentfroma global perspective.

Also offered for graduate-level credit as Int1560 and may be taken only once for credit. Cross-Listed as: This course is the same as PS 460 and may only be taken once for credit.

## Intl 461 - Politics of Economic Reform in Modern Turkey (4)

This course is designed to provides tudents with an in depth study of political development literature with a focus on modern Turkey. We will examine how modern Turkish republic emerged fromthe ashes of the Ottoman Empire and evaluate stages of economic development during the first, second, and third republic. Finally, we will assess the implications of Turkey's new geopolitics (since the end of the Cold W ar) on Turkish economic development in a global perspective. This course is cross-listed as PS 461 and may be taken only once forcredit.
Also offered for graduate-levelcredit as Int1561 and may be taken only once for credit. Cross-Listed as: PS 461.
Intl 470 - Intercultural Leadershipand Change (4)
Prepares students for citizenship, leadership, scholarship, and research in a changing and globalized world. Culls perspectives fromextant intercultural scholarship. Develops analytical tools to reflect upon politically created difference in race, religion, class and gender in cosmopolitan societies.

Prerequisite: Upper-division standing.

## Intl 471 - Understanding the International Experience

 (4)Examination of communication-based dimensions of an international or intercultural experience, including teaching English to speakers of other languages. Development of strategies and activities required to meet the challenges of teaching, working, or doing research in an international/ intercultural setting. All linguis tics students must register for Ling 471/Ling 571 which includes a zero-credit lab. This is the same course as Ling 471 and may only be taken once for credit.
Prerequisite: upper-division or postbac academic standing. Cross-Listed as:Ling 471.

## Intl 490 - Global Sustainable Development (4)

An examination of key concepts of sustainable development, policies associated with sustainable development in developing nations, and the power relations inherentto these policies. The subject matter is
approached froman interdisciplinary perspective. Recommended prerequisites: Int1397.

Intl 501 - Research (1-9)
(Credit to be arranged.)

Intl 504 - Cooperative Education/Internship (1-9)
(Credit to be arranged.)

Intl 505 -Reading and Conference (1-9)
(Credit to be arranged.)

Intl 507 -Seminar (1-6)
(Credit to be arranged.)

## Intl 510 -SelectedTopics (1-6)

(Credit to be arranged.)

## Intl 560 -Political Development in Modern Turkey (4)

Designed to provide students with an in -depth study of political development literature with a focus on modern Turkey. Examines how a modern Turkish republic emerged from the ashes of the Ottoman Empire and evaluates stages of political development during the first, second, and third republic. Finally, as sesses the implications of Turkey's new geopolitics (post Cold War) on Turkish political and economic development froma global perspective.
Also offered for undergraduate-level credit as Int1460 and may be taken only once for credit. Cross-Listed as:This course is the same as PS 560 and may only be taken once for credit.

## Intl 561 -Politics of Economic Reform in Modern Turkey (4)

This course is designed to providestudents with an in depth study of political development literature with a focus on modern Turkey. We will examine how modern Turkish republic emerged fromthe ashes of the Ottoman Empire and evaluate stages of economic development during the first, second, and third republic. Finally, we will assess the implications of Turkey's new geopolitics (since the end of the Cold War) on Turkish economic development in a global perspective. This course is cross-lis ted as PS 561 and may be taken only once for credit.

Also offered for undergraduate-level credit as Intl461 and may be taken only once for credit. Cross-Listed as:PS 561.

## ISQA - Infor Systems \& Quant Analysis

## ISQA 111 - Fundamental Computer Concepts (2)

The fundamentalconcepts of Electronic Data Processing; the impact of EDP on the firm, and the fundamental concepts of computer use including programming and applications. Provides a general vo cabulary and understanding of the capabilities of the computer in business. (One hour of lecture and two hours of recitation.)

## ISQA 360 - Computer Programming for Business Applications (4)

Introduction to the fundamental programming theories and concepts necessary to create software applications that address the information needs of an org anization.
Introduces business students to the object-oriented design, implementation, and testing of event-driven programs. Topics include class definition, methods, data types, control structures, and file-based interactive input/output. Provides an overview of the industry proven softwaredevelopment principles, and outlines the contribution that businessprofessionals make to the program-development process.
Prerequisite: BA 325, CS 106.
ISQA 399 - Special Studies (1-6)
(Credit to be arranged.)

## ISQA 405 - Reading and Conference (1-6)

(Credit to be arranged.)
Prerequisite: consent of instructor.

## ISQA 430 - Industrial Transportation and Freight (4)

Develops an understanding of various modes of transportation, primarily focused on business applications and the movement of freight. Operational characteris tics of the modes are evaluated, freight rate derivation and analyses are understood, and organizational evaluations of transportation strategies are studied. Transportation contract forms are analyzed and transportation risks are evaluated.
Prerequisite: BA 339.

## ISQA 431 - Transportation Regulation (4)

Evolution of transportation law in the U.S., including examination of case law as precedent. Designed forthose planning careers in transportation, logistics or supply chain management.

## Prerequisite: BA 339.

## ISQA 449 - Process Control and Improvement (4)

Study of the principles of quality management including statistical quality control, total quality management, and the quality tools especially as they apply to supply and logistics processes.
Prerequisite: BA 339.

## ISQA 501 - Research (1-8)

(Credit to be arranged.)

## ISQA 504 - Cooperative Education/Internship (1-6)

(Credit to be arranged.)

## ISQA 507 -Seminar (1-6)

(Credit to be arranged.)

## ISQA 510 - SelectedTopics (1-12)

(Credit to be arranged.)

## ISQA 510S - Selected Topics (4)

(Credit to be arranged.)

## ISQA 511 - Sus tainable Operations Management (4)

Introduction to the concepts and analytic methods that are useful in understanding the management of a firm's operations and supply chain. The aimof the course is to (1) familiarize students with the basic language, concepts, insights and tools of operations and supply chain management, (2) demonstrate principles and methods for integrating sustainability into an organization using concepts such as the ToyotaProduction System, cradle-tocradle principles, green procurement, and life cycle analys is, and (3) explore the relationship between sustainable supply chains and local and global economies in terms of environmentalimpact and social contribution.

## ISt - Interdisciplin St

## ISt 199 - Special Studies (1-5)

(Credit to be arranged.)

## ISt 299 - Special Studies (0-6)

(Credit to be arranged.)

## ISt 399 -Special Studies (1-12)

(Credit to be arranged.) For Extended Studies and Summer Sessiononly.

## ISt 404 - Cooperative Education/Internship (1-9)

(Credit to be arranged.)

## ISt 410 -SelectedStudies (1-8)

(Credit to be arranged.)

## ISt 499 -Special Studies (0-6)

(Credit to be arranged.)

## ISt 501 - Research (1-6)

(Credit to be arranged.)

## ISt 503 -Thesis (1-12)

(Credit to be arranged.)

## ISt 505 - Reading and Conference (1-8)

(Credit to be arranged.)

## ISt 506 -Special Projects (1-6)

(Credit to be arranged.)

## ISt 510 -SelectedStudies (1-8)

(Credit to be arranged.)

## ISt 520 - Introduction to Foresight and Futures Practice (4)

Introduces futures thinking and the related social science anchored practice of foresight. Includes a history and evolution of futures practice in the private and public sector. As an emerging social science and growing presence in emerging government and private sector practice, futures thinking and work acknowledges deep acceleration in change, disruption and related volatility, power relations, uncertainty, complexity and ambiguity and a need for navigation skills to succeed in "postnormal" times.

## ISt 521 - Applying Foresight Frameworks and Building Futures Practice (4)

Advanced class to deepen student understanding and knowledge futures thinking and the related skills of applied and ethical foresight to real world interdis ciplinary challenges. Includes an overview of settings and methods where foresight is currently being practiced in both the public and privatesectors, and profiles of futurists who lead these processes. Focuses on methods which democratize and diversify thefuture.
Prerequisite:ISt 520.

## ISt 522 - Integrative Futures Practice (2)

Advanced class to integrate the course work student has taken for his/her/their Foresight Practice Certificate. After taking the two required and elective courses related to student area of interest, this class provides students the opportunity to integrate his/her/their learning regarding futures knowledge and foresight practice. Acquisition and presentation of strategies to democratize co-creation of shared futures, acknowledge/address bias and patterns of inequity will be prioritized, culminating in a practice portfolio.
Prerequisite:ISt 520, ISt 521, and required electives.

## ISt 610 - SelectedStudies (1-4)

(Credit to be arranged.)

## ISt 699 - Special Studies (1-6)

(Credit to be arranged.)

## It - Italian

## It 101 - First-Year Italian Term 1 (4)

An introduction to elementary Italian. Emphas is on lis tening comprehension and oral practice, the elements of grammar, vocabulary building, andelementary readings. This is the first course in a sequence of three: It 101, It 102 , and It 103.

## It 102 - First-Year Italian Term 2 (4)

An introduction to elementary Italian. Emphasis on listening comprehension and oral practice, the elements of grammar, vocabulary building, and elementary readings. This is the second course in a sequence of three: It 101, It 102, and It 103.

## It 103 - First-Year Italian Term 3 (4)

An introduction to elementary Italian. Emphas is on listening comprehension and oral practice, the elements of grammar, vocabulary building, andelementary readings. This is the third course in a sequence of three: It 101, It 102 , and It 103.

## It 199 - Special Studies (1-12)

(Credit to be arranged.)

## It 201 -Second-Year Italian Term 1 (4)

Intensive review of basic materials introduced in first-year programand further development of communication skills. This is the first course in a sequence of three: It 201, It 202, and It 203. Recommended prerequisite: It 103.

## It 202 -Second-Year Italian Term 2 (4)

Intensive review of basic materials introduced in first-year programand further development of communication skills. This is the secondcourse in a sequence of three:It 201, It 202, and It 203. Recommended prerequisite: It 103.

## It 203 -Second-Year Italian Term 3 (4)

Intensive review of basic materials introduced in first-year programand further development of communication skills. This is the third course in a sequence of three: It 201, It 202, and It 203. Recommended prerequisite: It 103.

## It $\mathbf{2 9 9}$ - Special Studies (1-12)

(Credit to be arranged.)

## It 301 - Third-Year Italian Term 1 (4)

Composition and conversation at the intermediate level. This is the first course in a sequence of three: It 301, It 302, and It 303. Recommended prerequisite: It 203.

## It 302 - Third-Year Italian Term 2 (4)

Composition and conversation at the intermediate level. This is the secondcourse in a sequence of three: It 301, It 302, and It 303. Recommended prerequisite:It 203.

## It 303 - Third-Year Italian Term 3 (4)

Composition and conversation at the intermediate level. This is the third course in a sequence of three: It 301, It 302, and It 303. Recommended prerequisites: It 301, 302.

## It 330 - Italian Culture and Civilization (4)

Surveys major trends and development in Italian culture and civilization from its origins to the present. Includes historical, political, social, artistic and intellectual perspectives. Taught in English.

## It 344U - Italian Literary and Cultural Movements (4)

Thematic study of Italian and Italian-related literary movements and works within the world context, with emphases on feminism, war, dictatorship, resistance, and social practice. To be taken at any time during the third year of study.
Prerequisite: It 203 or equivalent.

## It 390 - History of Italian Language (4)

Introduction to the his tory of the Italian language, from late 800 AD to 1900 . Introduction to the most representative documents that shaped the Italian Language and to the differences between the various Italian dialects. Focus on the importance of the work by Dante Alighieri, Francesco Petrarca and Giovanni Boccaccio, Renaissance authors and major linguistics theories of 1800. Taught in Italian. Expected preparation: It 203.

## It 399 - Special Studies (1-9)

(Credit to be arranged.)

## It 404 - Cooperative Education/Internship (1-12)

(Credit to be arranged.)

## It 409 - Practicum(1-12)

(Credit to be arranged.)

## It 410 -Selected Topics (1-9)

(Credit to be arranged.)

TP - Initial Teacher Preparation
ITP 402 - Independent Study (1-12)
(Credit to be arranged.)

ITP 407 -Seminar (1-12)
(Credit to be arranged.)

ITP 409 - Practicum(1-12)
(Credit to be arranged.)

## ITP 410 -SelectedStudies (1-12)

(Credit to be arranged.)

## ITP 411 - Classroom Management for StudentSuccess (1-3)

Theories, principles, and practices of clas sroom management for middle and high school teachers. Topics include community, relationships, communication, cultural responsiveness, organizational procedures, classroom routines, problem-solving, decision making and responding to disruptions. Course emphasizes creating positive learning environments for students fromdiverse backgrounds in multicultural clas srooms.
Also offered for graduate-level credit as ITP 511 and may be taken only oncefor credit. . Prerequisite: admission to the BilingualTeacherPathway Program, Graduate Teacher Education Program, or Secondary Dual Educator Program.

## ITP 412 - Learning and the Learner (1-3)

Candidates identify themselves as learners, recognize the learning needs of their students, understand the learning theories relevant to educational practice, and identify the most useful elements of learning theories to informtheir developing educational philosophy. Identify effective strategies and learning environments to maximize content and process outcomes for diverse students.
Also offered for graduate-level credit as ITP 512 and may be taken only once for credit. . Prerequisite: admission to a teacher education program.
ITP 414 -Educating for Equity and Social Justice (3)
Explore is sues of identity, linguistics, race, ethnicity, sexual orientation, gender, social class, ability, and other forms of diversity. Teacher candidates gain an understanding of how culture influences educational processes, as well as their role and res ponsibility in creating socially just and equitable classrooms/schools, where all students and families are valued.

Also offered for graduate-level credit as ITP 514 and may be taken only once for credit. . Prerequisite: Admis sion into the Graduate Teacher Education Program(GTEP), Secondary DualEndorsement Program(SDEP), or the Bilingual Teacher Pathway (BTP) Programand others with instructor approval. .

## ITP 421 -Secondary Art Methods (2-4)

Issues and methods in selecting and organizing materials for instruction in middle level/high art education. Examines a variety of profes sional res ources av ailable to support learning. Introduces research-based instructional practices and lesson/unit planning. Situates teaching, learning, and as sessment within the context of state and nationalstandards.

Also offered for graduate-level credit as ITP 521 and may be taken fall, winter, and spring terms for credit. .
Prerequisite: Admission into the Secondary Graduate TeacherEducation Program(GTEP), Secondary Dual Endorsement Program(SDEP), or the Bilingual Teacher Pathway (BTP)Program.

## ITP 422 - Secondary English Language Arts Methods (2-4)

Issues and methods in selecting and organizing materials for instruction in middle level/high school language arts education. Examines a variety of professional res ources av ailable to support learning. Introduces research-based instructional practices and les son/unit planning. Situates teaching, learning, and assessment within the context of state and national standards.
Also offered for graduate-level credit as ITP 522 and may be taken fall, winter, and spring terms for credit. . Prerequisite: Admission into the Secondary Graduate TeacherEducation Program(GTEP), Secondary Dual Endorsement Program(SDEP), or the BilingualTeacher Pathway (BTP) Program.

## ITP 423 - Secondary Health and Physical Education Methods (2-4)

Issues and methods in selecting and organizing materials for instruction in middle and high school health and K-12 physical education. Examines a variety of professional resources available to support learning. Introduces research-based instructional practices and lesson/unit planning. Situates teaching, learning, and assessment within the context of state and national standards.

Also offered for graduate-level credit as ITP 523 and may be taken fall, winter, and spring terms for credit. . Prerequisite: Admis sion into the Master of Education degree programand admis sion into Teacher Education Program.

## ITP 424 -Secondary Mathematics Methods (2-4)

Issues and methods in selecting and organizing materials for instruction in middle level and high mathematics education. Examines a variety of professionalres ources available to support learning. Introduces research-based instructional practices and les son/unit planning. Situates teaching, learning, and assessment within the context of state and national standards.
Also offered for graduate-level credit as ITP 524 and may be taken fall, winter, and spring terms for credit.

## ITP 425 -Secondary Music Methods (2-4)

Issues and methods in selecting and organizing materials for instruction in middle level/high music education. Examines a variety of profes sional resources av ailable to support learning. Introduces research-based instructional practices and lesson/unit planning. Situates teaching, learning, and assessment within the context of state and national standards.
Also offered for graduate-level credit as ITP 525 and may be taken fall, winter, and spring terms for credit. .
Prerequisite: Admis sion into the Secondary Graduate Teacher Education Program(GTEP), Secondary Dual Endorsement Program(SDEP), or the BilingualTeacher Pathway (BTP) Program.

## ITP 426 -Secondary Science Methods (2-4)

Issues and methods in selecting and organizing materials for instruction in middle level/high school science education. Examines a variety of professional res ources available to support learning. Introduces research-based instructional practices and les son/unit planning. Situates teaching, learning, and assessment within the context of state and national standards.

Also offered for graduate-level credit as ITP 526 and may be taken fall, winter, and spring terms for credit. .
Prerequisite: Admis sion into a graduate teacher preparation program.

## ITP 427 -Secondary Social Studies Methods (2-4)

Issues and methods in selecting and organizing materials including digital resources for instruction in middle level and high school social studies education. Examines a variety of professional res ources available to support learning. Introduces res earch-based instructional practices and lesson/unit planning. Situates teaching, learning, and as sessment within the context of state and national standards.
Also offered for graduate-level credit as ITP 527 and may be taken fall, winter, and spring terms for credit. .
Prerequisite: Admis sion into the Secondary Graduate Teacher Education Program(GTEP), Secondary Dual Endorsement Program(SDEP), or the BilingualTeacher Pathway (BTP) Program.

## ITP 428 - Secondary WorldLanguages Methods (2-4)

Issues and methods in selecting and organizing materials for instruction in middle level and high school world languages. Examines a variety of profes sional resources available to support learning. Introduces research-based instructional practices and les sion/unit planning. Situates teaching, learning, and assessment within the context of state and national standards.
Also offered for graduate-level credit as ITP 528 and may be taken fall, winter, and spring terms for credit. .
Prerequisite: admission to the Bilingual Teacher Pathway Program.

## ITP 442 - Integrated Elementary Science Methods (2)

Emphasis on effective methods and practices for developing integrated, interdisciplinary units of instruction. Explore approaches to teaching science at the elementary grades and integrating science content and processes with content and processes fromother contentareas (e.g., literacy, mathematics, the arts).
Also offered for graduate-level credit as ITP 542 and may be taken only once for credit. .Prerequisite: Admis sion to Elementary Graduate Teacher Education Programor Bilingual TeacherPathway Program.

## ITP 452 - Reflective Practitioner (1-3)

Perspectives and techniques for formal and informal analysis, information gathering, decision making, value judgments abouteducational practice.

Also offered for graduate-level credit as ITP 552 and may be taken for credit in winter and spring terms. .
Prerequisite: admission to the teacher education program.

## ITP 502 - Independent Study (1-12)

(Credit to be arranged.)

## ITP 504 - Cooperative Ed/Internship (1-9)

(Credit to be arranged.)

## ITP 505 - Reading and Conference (1-9)

(Credit to be arranged.)

## ITP 506 -Special Projects (1-6)

(Credit to be arranged.)

## ITP 507 -Seminar (1-9)

(Credit to be arranged.)

## ITP 508 - Workshop(1-8)

(Credit to be arranged.)

## ITP 509 - Practicum(1-12)

(Credit to be arranged.)

## ITP 510 -Special Topics (1-15)

(Credit to be arranged.)

## ITP 511 - Classroom Management for Student Success (1-3)

Theories, principles, and practices of clas sroom management for middle and high school teachers. Topics include community, relationships, communication, cultural responsiveness, organizational procedures, classroom routines, problem-solving, decision making and responding to disruptions. Course emphasizes creating positive learning environments for students fromdiverse backgrounds in multicultural classrooms.

Also offered for undergraduate-level credit as ITP 411 and may be taken only once for credit. . Prerequis ite: admis sion to the Bilingual TeacherPathway Program, Graduate Teacher Education Program, or Secondary Dual Educator Program.

## ITP 512 - Learning and the Learner (1-3)

Candidates identify themselves as learners, recognize the learning needs of their students, understand the learning theories relevant to educational practice, and identify the most useful elements of learning theories to inform their developing educational philosophy. Identify effective strategies and learning environments to maximize content and process outcomes for diverse students.

Also offered for undergraduate-level credit as ITP 411 and may be taken only once for credit. . Prerequis ite: admis sion to a teacher education program.

## ITP 513 - Technology as a Tool for Learning (3)

Explore and design technology-enhanced learning through inclusive strategies in planning, ins truction, and as sessment. Build upon the principles of Universal Design for Learning to integrate digital tools and media into a variety of face-to-face, hy brid, and virtual environments that advance student learning, creativity, and innovation. Employ EdTech frameworks to gain a broad understanding of media literacy, digital equity, and working with diverse learners.

Prerequisite: Admis sion into the Secondary Graduate Teacher Education Program(GTEP), Secondary Dual Endorsement Program(SDEP), or the BilingualTeacher

Pathway (BTP) Programand others with instructor approval.

## ITP 514 - Educating for Equity and Social Justice (3)

Explore is sues of identity, linguistics, race, ethnicity, sexual orientation, gender, social class, ability, and other forms of diversity. Teacher candidates gain an understanding of how culture influences educational processes, as well as their role and responsibility in creating socially just and equitable classrooms/schools, where all students and families are valued.

Also offered for undergraduate-levelcredit as ITP 414 and may be taken only once for credit. . Prerequisite: Admission into the Graduate TeacherEducation Program (GTEP), Secondary Dual Endorsement Program(SDEP), or the Bilingual Teacher Pathway (BTP) Programand others with instructor approval. .

## ITP 515 - Foundations of Culturally and Linguistically Responsive Practice at the Secondary Level (3)

This course will equip secondary teacher candidates with knowledge and skills to facilitate instruction for English LanguageLearners (ELLs). Candidates learn the developmental progress of acquiring English for ELLs, and the role/responsibility of the teacher to create a positive climate and utilize instructional strategies that are culturally and linguistically responsive.
Prerequisite: Admission into the Secondary Graduate TeacherEducation Program, Secondary Dual Endorsement Program(SDEP), or the Bilingual Teacher Pathway (BTP) program, and others with instructor approval.

## ITP 516 - Engaging Young Adolescent Learners (3)

Approaches foreffectively educating young adolescents ( 10 to 15 yearolds) in middle grades schools. Emphasizes identity formation, developmental res ponsiveness, motivation and engagement, culturally relevant practice, instructional strategies, and authentic learning opportunities. Examines educational policy and current trends in secondary school reform. Also addresses transitions occurring between school levels.
Prerequisite: Admission to the Graduate Teacher Education Program, Master's in Curriculumand Instruction, and others with instructor approval.

## ITP 517 - Engaging Adolescent Learners (3)

Approaches for effectively educating adolescent learners. Includes student motivation and en gagement, instructional strategies, developmentally responsive approaches, culturally responsive practice, and authentic learning opportunities. Examines educational policy in middle grades schools (K-8, 6-8) and high schools (9-12) and current trends of high school/middle school reform.

Prerequisite: Admis sion to the Secondary Graduate Teacher Education Program, Masters in Curriculumand Instruction, and others with instructor approval.

## ITP 518 - Ass essment for Learning (2)

Concentrated study of key terminology around assessment and the application of multiple as sessment methods to engage learners in their own growth, to monitor learner progress, and to guide instructional decision-making. Course includes strategies and procedures to collect, interpret and acton assessment data. Expected preparation: Admis sion into theSecondary Graduate Teacher Education Program.

## ITP 520 -Literacies in the Disciplines (3)

Course designed to help educators guide their students in acquiring skills needed for adequate reading, thinking, writing, and study in content areas. Emphas is on the functional teaching of reading and writing, the design and preparation of materials to use with textbooks in all school subjects.
Prerequisite: admis sion to a teacher education program.

## ITP 521 -Secondary Art Methods (2-4)

Issues and methods in selecting and organizing materials for instruction in middle level/high art education.
Examines a variety of profes sional resources available to support learning. Introduces research-based instructional practices and lesson/unit planning. Situates teaching, learning, and assessment within the context of state and national standards.
Also offered for undergraduate-level credit as ITP 421 and may be taken fall, winter, and spring terms for credit. . Prerequis ite: Admis sion into the Secondary Graduate Teacher Education Program(GTEP), Secondary Dual Endorsement Program(SDEP), or the BilingualTeacher Pathway (BTP) Program. .

## ITP 522 -Secondary English Language Arts Methods (2-4)

Issues and methods in selecting and organizing materials for instruction in middle level/high school language arts education. Examines a variety of professional res ources available to support learning. Introduces research-based instructional practices and les son/unit planning. Situates teaching, learning, and assessment within the context of state and national standards.

Also offered for undergraduate-level credit as ITP 422 and may be taken fall, winter, and spring terms for credit. . Prerequisite: Admis sion into the Secondary Graduate Teacher Education Program(GTEP), Secondary Dual Endorsement Program(SDEP), or the Bilingual Teacher Pathway (BTP) Program.

## ITP 523 -Secondary Health and Physical Education Methods (2-4)

Issues and methods in selecting and organizing materials for instruction in middle and high school health and K-12 physical education. Examines a variety of professional resources available to support learning. Introduces research-based instructional practices and lesson/unit planning. Situates teaching, learning, and assessment within the context of state and national standards.
Also offered for undergraduate-levelcredit as ITP 423 and may be taken fall, winter, and spring terms for credit. . Prerequisite: Admission into the Master of Education degree programand admis sion into Teacher Education Program.

## ITP 524-Secondary Mathematics Methods (2-4)

Issues and methods in selecting and org anizing materials for instruction in middle level and high mathematics education. Examines a variety of professional res ources av ailable to support learning. Introduces research-based instructional practices and les son/unit planning. Situates teaching, learning, and assessment within the context of state and national standards.

Also offered for undergraduate-level credit as ITP 424 and may be taken fall, winter, and spring terms for credit.

## ITP 525 -Secondary Music Methods (2-4)

Issues and methods in selecting and organizing materials for instruction in middle level/high music education. Examines a variety of profes sional resources available to support learning. Introduces research-based instructional practices and lesson/unit planning. Situates teaching, learning, and assessment within the context of state and national standards.

Also offered for undergraduate-level credit as ITP 425 and may be taken fall, winter, and spring terms for credit. . Prerequisite: Admission intothe Secondary Graduate TeacherEducation Program(GTEP), Secondary Dual Endorsement Program(SDEP), or the Bilingual Teacher Pathway (BTP) Program.

## ITP 526-Secondary ScienceMethods (2-4)

Issues and methods in selecting and organizing materials for instruction in middle level/high school science education. Examines a variety of professional resources available to support learning. Introduces research-based instructional practices and les son/unit planning. Situates teaching, learning, and assessment within the context of state and national standards.
Also offered for undergraduate-level credit as ITP 426 and may be taken fall, winter, and spring terms for credit. . Prerequisite: Admission into a graduate teacher preparation program.

## ITP 527 -Secondary Social Studies Methods (2-4)

Issues and methods in selecting and organizing materials including digital res ources for instruction in middle level and high school social studies education. Examines a variety of professional res ources available to support learning. Introduces research-based instructional practices and lesson/unit planning. Situates teaching, learning, and assessment within the context of state and national standards.
Also offered for undergraduate-level credit as ITP 427 and may be taken fall, winter, and spring terms for credit. . Prerequisite: Admis sion into the Secondary Graduate Teacher Education Program(GTEP), Secondary Dual Endorsement Program(SDEP), or the BilingualTeacher Pathway (BTP) Program.
ITP 528 -Secondary WorldLanguages Methods (2-4)
Issues and methods in selecting and org anizing materials for instruction in middle level and high school world languages. Examines a variety of professional resources av ailable to support learning. Introduces research-based instructional practices and lesson/unit planning. Situates teaching, learning, and assessment within the context of state and national standards.
Also offered for undergraduate-level credit as ITP 428 and may be taken fall, winter, and spring terms for credit. . Prerequisite: admis sion to the Bilingual Teacher Pathway Program.

## ITP 529 - Professional Seminar -Secondary (1)

A companion seminar during Student Teaching I in a middle orhigh school to support teacher candidates in developing, clarifying, and applying attitudes and beliefs about quality educational practices through professional collaborative reflection.
Prerequis ite: admis sion to the Secondary GraduateTeacher Education Program.

## ITP 530 -Student Teaching I, Middle/High School (8)

Teacher candidates will collaborate and independently plan, teach, as sess, and reflect under the guidance of their Cooperating Teacher and University Supervisor. In addition, teacher candidates will participate in related professional activities at their placementschool. Candidates will engage in ongoing inquiry and connection between theory and practice.
Prerequisite: Admis sion to the teacher education program; successful completion of Initial Field Experience.

## ITP 531 -Student Teaching II, Middle/High School (13)

Teacher candidates will collaborate and independently plan, teach, as sess, and reflect under the guidance of their Cooperating Teacher and University Supervisor.In addition, teacher candidates will participate in related
profes sional activities at their placement school. Candidates willengage in ongoing inquiry and connection between theory and practice.

Prerequisite: Admission to the teacher education program and ITP 530.

ITP 532 - Student Teaching I, Art/Music/PEK-12 (8)
Teachercandidates will collaborate and independently plan, teach, as sess, and reflect under the guidance of their Cooperating Teacher and University Supervisor. In addition, teacher candidates will participate in related profes sional activities at their placement school. Candidates willengage in ongoing inquiry and connection between theory and practice.
Prerequisite: Admission to the teacher education program; successful completion of InitialField Experience.

## ITP 533 - Student Teaching II: Art/Music/PEK-12 (13)

Teachercandidates will collaborate and independently plan, teach, as sess, and reflect under the guidance of their Cooperating Teacher and University Supervisor. In addition, teacher candidates will participate in related profes sional activities at their placement school. Candidates will engage in ongoing inquiry and connection between theory and practice.

Prerequisite: Admission to a secondary teacher education programand ITP 532.

## ITP 534 - Foundations of Culturally and Linguistically Responsive Practice at the Elementary Level (2)

This course will equip elementary teacher candidates with knowledge and skills to org anize instruction for English LanguageLearners (ELL). Candidates learn the developmental progress of acquiring EnglishforELL students, and the role/responsibility of teacher to create a positive climate and utilize ins tructional strategies that are culturally and linguistically responsive.
Prerequisite: Admission into the Elementary Graduate Teacher Education Program. Prerequisites: Admis sion into the Elementary Graduate Teacher Education Program, Secondary DualEndorsement Program(SDEP), or the Bilingual TeacherPathway (BTP) program, and others with instructor approval.

## ITP 535-Cultivating Responsive Elementary Classrooms (1)

This three-part course explores approaches to designing the social, physical, and instructional environment of a classroomin a way that is responsive to students and supports learning. Summer and fall terms involve face-toface sessions addressing classroomclimate and culturally responsive practices. Winter terminvolves online discussion of differentiation and planning.

Prerequisite: admis sion to Elementary Graduate Teacher Education Program.

## ITP 536 -Learning and Development (3)

Prospective elementary educators will understand and apply principles of human learning and development. The psychology of learning in a school setting includes both individual and group generalizations. This course will explore the roles of teacher as facilitator of learning and decision maker to bestmeet learners' needs.

Prerequis ite: admis sion to Elementary Graduate Teacher Education Program.

## ITP 537 - Instructional Design and Assessment (1-3)

This yearlong course explores the theoretical frameworks and practical strategies that assist novice teachers in planning effective classroomcurricula, assessments and instruction, while focusing on the developmental and learning needs of learners.
Prerequisite: Admis sion to the Graduate Teacher Education Program(GTEP).

## ITP 538 - Integrated Methods (4)

Emphasizes inquiry processes in the various contentareas, and place-based, project based approaches to teaching and learning in grades PreK-8. Design integrated units of study that focus on social studies, art, music, and movement.
Also offered for undergraduate-level credit as ITP 438 and may be taken only once for credit. . Prerequisite:
Admission to a teacher education program.
ITP 539 -Elementary Mathematics Methods (1-4)
Emphasizes meaningful understanding of elementary-level mathematics content. Situates teaching, learning, and as sessment within the context of state and national standards as well as research proven practices. Focuses on strategies for developing competence with teaching through problem solving and teaching students in a developmentally appropriate, culturally responsive manner.
Prerequisite: Admis sion to the Graduate Teacher Education Program.

## ITP 540 - Foundations of Literacy (4)

An introduction to literacy processes. Address teaching practices specifically for elementary learners in grades PK3. Examine emergent and early reading processes, how to as sess them, and how to support their development in classrooms.Literacy development characteristics and teaching approaches for students who are culturally and linguistically diverse are addressed explicitly in the course.
Prerequisite: Admis sion to the Graduate Teacher Education Program(GTEP).

## ITP 541 -Literacies in the Elementary Classroom (4)

Emphas is on the methods and theories surrounding teaching and learning literacy in grades 3-8. Literacy development characteristics and teaching approaches for diverse learners are addressed, as well as the integration of literacy across content areas.

Prerequisite: admission to Elementary Graduate Teacher Education Program.

## ITP 542 - Integrated Elementary Science Methods (2)

Emphasis on effective methods and practices for developing integrated, interdisciplinary units of ins truction. Explore approaches to teaching science at the elementary grades and integrating science content and processes with content and processes fromother contentareas (e.g., literacy, mathematics, the arts).
Also offered for undergraduate-levelcredit as ITP 442 and may be taken only once for credit. . Prerequisite: Admission to Elementary Graduate Teacher Education Programor Bilingual Teacher Pathway Program.

## ITP 543 - Professional Collaboration in Elementary Education (1-3)

This course over four terms facilitates collaborative profes sional learning centered on improvement of fieldbased practices to support learners. Candidates will engage in systematic observation and examination of one's own practice and engage in a cycle of inquiry to systematically study their teaching and/or learning within their clinical experience. In addition, students design and implement their capstone project.
Prerequisite: Must be admitted into a teacher education program.

## ITP 545 -Student Teaching I, Early Childhood (1-4)

Observation, collaborative and independent planning, teaching, as sessment, and reflection under the guidance of the Cooperating Teacher and University Supervisor; related professional activities. Ongoing inquiry and connection of theory and practice, including methods coursework.
Prerequisite: Admission to the teacher education program.

## ITP 546 - Student Teaching II, Early Childhood (6-9)

Observation and teaching under direction of classroom teacher and University supervisor. Direct responsibility for learning activities, developing skills in techniques of teaching and classroommanagement; related professional activities. Weekly seminar.

Prerequisite: admission to the teacher education program.
ITP 547 - Student Teaching III, Early Childhood (12)
Observation, collaborative and independent planning, teaching, as sessment, and reflection under the guidance of
the Cooperating Teacher and University Supervisor; related professional activities. Ongoing inquiry and connection of theory and practice, including methods coursework. Completion of the second unit of study. Seminar meetings and programevents.
Prerequis ite: admis sions to the Elementary Graduate Teacher Education Program.

## ITP 548 -Student Teaching I, Elementary (1-4)

Observation, collaborative and independent planning, teaching, as sessment, and reflection under the guidance of the Cooperating Teacher and University Supervisor; related professional activities. Ongoing inquiry and connection of theory and practice, including methods coursework.

Prerequisite: Admis sion to the teacher education program.

## ITP 549 -Student Teaching II, Eementary (6-9)

Observation, collaborative and independent planning, teaching, as sessment, and reflection under the guidance of the Cooperating Teacher and University Supervisor; related professional activities. Ongoing inquiry and connection of theory and practice, including methods coursework. Completion of the first unit of study.

Prerequisite: Admis sion to the teacher education program.

## ITP 550 -Student Teaching III, Elementary (12)

Observation, collaborative and independent planning, teaching, as sessment, and reflection under the guidance of the Cooperating Teacher and University Supervisor; related professional activities. Ongoing inquiry and connection of theory and practice, including methods cours ework. Completion of the second unit of study. Seminar meetings and programevents.
Prerequisite: admis sion to Elementary Graduate Teacher Education Program.

## ITP 551 - Research and Classroom Inquiry (1-4)

Principles of teacher action research. Involves systematic observation and examination of one's own practice. Develop stance toward critical reflection through an inquiry cycle of gathering and analyzing clas sroomdata. Identify area of focus about an as pect of teaching and/or learning to systematically study during clinical experience.
Prerequisite: Admis sion to the teacher education program.

## ITP 552 - Reflective Practitioner (1-3)

Perspectives and techniques for formal and informal analysis, information gathering, decision making, value judgments about educational practice.
Also offered for undergraduate-level credit as ITP 452 and may be taken for credit in winter and spring terms. .
Prerequis ite: admis sion to the teacher education program.

## ITP 580 - Student Teaching I in Inclusive ML/HS (6)

Observation, collaborative and independent planning, teaching, as sessment, and reflection under the guidance of the Cooperating Teacher and University Supervisor; related professional activities. Ongoing inquiry and connection of theory and practice, including methods coursework. Completion of the first unit of study. Seminar meetings and programevents.
Prerequisite: Admission to the Secondary DualEducator Preparation Program.

## ITP 581 -Student Teaching II in Inclusive ML/HS (12)

Observation, collaborative and independent planning, teaching, as sessment, and reflection under the guidance of the Cooperating Teacher and University Supervisor; related professional activities. Ongoing inquiry and connection of theory and practice, including methods coursework. Completion of the second unit of study. Seminar meetings and programevents.

Prerequisite: Admission to the Secondary Dual Educator Preparation Program.

Jpn - Japanese

## Jpn 101 -First-Year Japanese Term1 (5)

An introduction to the Japanese language with emphasis on lis tening comprehension, speaking, grammatical patterns, the syllabaries, and characters in elementary reading and writing. This is the first course in a sequence of three: Jpn 101, Jpn 102, and Jpn 103.

## Jpn 101L - Lab for Japanese 101 (0)

Lab for Japanese 101.
Corequisite: Jpn 101.
Jpn 102 -First-Year Japanese Term 2 (5)
An introduction to the Japanese language with emphasis on listening comprehension, speaking, grammatical patterns, the syllabaries, and characters in elementary reading and writing. This is the second course in a sequence of three: Jpn 101, Jpn 102, and Jpn 103.

## Jpn 102L - Lab for Japanese 102 (0)

Lab for Japanese 102.
Corequisite: Jpn 102.

## Jpn 103 -First-Year Japanese Term 3 (5)

An introduction to the Japanese language with emphasis on listening comprehension, speaking, grammatical patterns, the syllabaries, and characters in elementary reading and
writing. This is the third course in a sequence of three: Jpn 101, Jpn 102, and Jpn 103.

Jpn 103L - Lab for Japanese 103 (0)
Lab for Japanese 103.
Corequisite: Jpn 103.
Jpn 150 - First-year Japanese (Intensive) (7)
A two-termcourse covering the content of Jpn 101,102,103.

Jpn 151 - First-year Japanese (Intensive) (8)
A two-termcourse covering the content of Jpn 101,102,103.

Jpn 199 -Special Studies (1-8)
(Credit to be arranged.)

## Jpn 201 -Second-Year Japanese Term 1 (5)

Continued work in the Japanese language with emphasis on listening comprehension, speaking, grammatical patterns, thes yllabaries, and characters in elementary reading and writing. This is the first course in a sequence of three: Jpn 201, Jpn 202, and Jpn 203.

Prerequisite: Jpn 103.
Jpn 201L- Lab for Japanese 201 (0)
Lab for Japanese 201.

Jpn 202 -Second-Year Japanese Term 2 (5)
Continued work in the Japanese language with emphasis on listening comprehension, speaking, grammatical patterns, the syllabaries, and characters in elementary reading and writing. This is the second course in a sequence of three: Jpn 201, Jpn 202, and Jpn 203. Expected preparation: Jpn 103.

Jpn 202L - Lab for Japanese 202 (0)
Lab for Japanese 202.
Corequisite: Jpn 202.

## Jpn 203 -Second-Year Japanese Term 3 (5)

Continued work in the Japanese language with emphasis on listening comprehension, speaking, grammatical patterns, the syllabaries, and characters in elementary
reading and writing. This is the third course in a sequence of three: Jpn 201, Jpn 202, and Jpn 203. Expected preparation: Jpn 103.

## Jpn 203L - Lab for Japanese 203 (0)

Lab for Japanese 203.
Corequisite: Jpn 203.

## Jpn 299 -Special Studies (1-12)

(Credit to be arranged.)

## Jpn 301 - Third-Year Japanese: Speaking and Listening Term1 (4)

Continued work in the Japanese language with emphasis on listening and speaking skills in a variety of contexts. Students enrolled in this course are encouraged to sign up for Jpn 301, 304 concurrently. This is the first course in a sequence of two: Jpn 301, and Jpn 302. Expected preparation: Jpn 203.

## Jpn 302 - Third-Year Japanese: Speaking and

 Listening Term 2 (4)Continued work in the Japanese language with emphasis on listening and speaking skills in a variety of contexts. Students enrolled in this course are encouraged to sign up for Jpn 302, 305 concurrently. This is the second course in a sequence of two: Jpn 301 and Jpn 302. Expected preparation: Jpn 203.

## Jpn 304 - Third-Year Japanese: Reading and Writing Term 1 (4)

Continued work in the Japanese language with emphasis on reading and writing skills in different kinds of texts. Students enrolled in this course are encouraged to sign up for Jpn 301, 304 concurrently. This is the first course in a sequence of two: Jpn 304 and Jpn 305. Expected preparation: Jpn 203.

## Jpn 305 - Third-Year Japanese: Reading and Writing Term 2 (4)

Continued work in the Japanese language with emphasis on reading and writing skills in different kinds of texts. Students enrolled in this course are encouraged to sign up for Jpn 302, 305 concurrently. This is the second course in a sequence of two: Jpn 304 and Jpn 305. Expected preparation: Jpn 203.

## Jpn 314 - Beginning Japanese Grammar (2)

A systematic approach to the study of Japanese grammar for transfer students, majors, and teachers. This is the first course in a sequence of two: Jpn 314 and Jpn 315.

Jpn 315 - Intermediate Japanese Grammar (2)
A systematic approach to the study of Japanese grammar for transferstudents, majors, and teachers. This is the second course in a sequence of two: Jpn 314 and Jpn 315.

Jpn 325 - Japanese Phonetics and Phonology (4)
Introduction to the sounds of Japanese: their place and manner of articulation (phonetics) as well as how they pattern with respect to each other and as influenced by morphological and syntactic factors (phonology). Expected preparation: Jpn 203.

## Jpn 332U- Japanese Religion through Literature and Performance (4)

A survey of important articulations of religion in premodern and modern Japanese literature, drama, film and comic books. Students explore the interplay of religion (Buddhism, Shinto and more) in canonical works of literary and performative culture.

Prerequis ite: 8 cr of literature. Prerequis ite: 8 credits of literature.

## Jpn 341U- Topics in Japanese Literature (In Translation)(4)

Introductory survey of Japanese literature fromits beginnings to the present, including such works as The Man'yoshu, The Tale of Genji, plays by Zeami and Chikamatsu, Basho's haiku, and masterpieces of modern fiction. Jpn 341 focuses on classical and medieval literature; Jpn 342 focuses on Tokugawa and modern literature. Conducted in English. This is the first course in a sequence of three: Jpn 341, Jpn 342, and Jpn 343. Recommended prerequisite: 8 credits of literature.

## Jpn 342U- Topics in Japanese Literature (In Translation)(4)

Introductory survey of Japanese literature fromits beginnings to the present, including such works as The Man'yoshu, The Tale of Genji, plays by Zeami and Chikamatsu, Basho's haiku, and masterpieces of modern fiction. Jpn 341 focuses on clas sical and medieval literature; Jpn 342 focuses on Tokugawa and modern literature. Conducted in English. This is the second course
in a sequence of three: Jpn 341, Jpn 342, and Jpn 343. Recommended prerequis ite: 8 credits of literature.

## Jpn 343 - Topics in Japanese Literature (In Translation) (4)

Introductory survey of Japanese literature fromits beginnings to the present, including such works as The Man'yoshu, The Tale of Genji, plays by Zeami and Chikamatsu, Basho's haiku, and masterpieces of modern fiction. Jpn 341 focuses on classical and medieval literature; Jpn 342 focuses on Tokugawa and modern literature. Conducted in English. This is the third course in a sequence of three: Jpn 341, Jpn 342, and Jpn 343.

## Jpn 344U- Japanese Literature in Translation: Manga, Japanese Graphic Novels (4)

Readings of masterpieces of Japanese comic books, analys is of writing about the graphic-novel form. Readings of the manga are followed by discussion of the artistic style, questions about Japanese society, and each novel's place in the history of the genre. Readings/discussions are in English. Expected preparation: 8 credits of literature.

## Jpn 345U - Manga Now! (4)

Readings of new, critically acclaimed Japanese comic books and analysis of recent writings about the graphicnovel form. Readings of the mang a are followed by a discussion of the artistic style, questions about Japanese society, and what kind of new developments are happening in the genre. Readings and discussions are in English. Expected preparation: Jpn 344.

## Jpn 361U- Japanese Literature Through Film (4)

Readings of masterpieces of Japanese literature and viewing of feature films based on them. Viewings are followed by discussion of the social, historical, and artistic significance of the works. Readings and discussions are in English, and films have English subtitles.

## Jpn 399 -Special Studies (1-12)

(Credit to be arranged.)

## Jpn 403 - Thesis (1-4)

(Credit to be arranged.)

Jpn 404 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

## Jpn 405 - Reading and Conference (1-8)

(Credit to be arranged.)

Jpn 407 -Seminar (1-6)
(Credit to be arranged.)

Jpn 408 - Workshop(1-8)
(Credit to be arranged.)

## Jpn 409 - Practicum(1-12)

(Credit to be arranged.)

## Jpn 410 -Selected Topics (1-12)

(Credit to be arranged.)

## Jpn 411 - Advanced Japanese (4)

Development of oral communication, reading, and writing skills with complex patterns in informal and formal situations. This is the first course in a sequence of two: Jpn 411 and Jpn 412. Expected preparation: Jpn 302, Jpn 305.

Also offered for graduate-level credit as Jpn 511 and may be taken only once for credit. .

## Jpn 412 - Advanced Japanese (4)

Development of oral communication, reading, and writing skills with complex patterns in informal and formal situations. This is the second course in a sequence of two: Jpn 411 and Jpn 412. Expected preparation: Jpn 302, Jpn 305.

Also offered for graduate-level credit as Jpn 512 and may be taken only once for credit. .
Jpn 413 - Advanced Japanese: Japanese for the Real World (4)

Development of Japanese language skills necessary in work settings and for practical use. Completion of Jpn 302 and Jpn 305 or equivalent proficiency level is expected.
Also offered for graduate-level credit as Jpn 513 and may be taken only once for credit. Prerequisite: Jpn 302 and Jpn 305 or equivalent proficiency level.

## Jpn 414 - Advanced Japanese Grammar (4)

A systematic approach to the study of Japanese grammar for advanced students and majors, and for teachers. Expected preparation: Jpn 302 or Jpn 315.
Also offered for graduate-level credit as Jpn 514 and may be taken only once forcredit. .

## Jpn 420 - Readings in Japanese Literature (4)

Reading, analysis, translation, and discussion of representative literary texts. Jpn 420/520 will focus on premodern literature, Jpn 421/521 on literature from the Meiji Period to the present. Conducted primarily in Japanese. This is the first course in a sequence of two: Jpn 420 and Jpn 421. Expected preparation: Jpn 302, Jpn 305.
Also offered for graduate-level credit as Jpn 520 and may be taken only once for credit. .

## Jpn 421 - Readings in Japanese Literature (4)

Reading, analysis, translation, and discussion of representative literary texts. Jpn 420/520 will focus on premodern literature, Jpn 421/521 on literature from the Meiji Period to the present. Conducted primarily in Japanese. This is the second course in a sequence of two: Jpn 420 and Jpn 421. Expected preparation: Jpn 302, Jpn 305.
Also offered for graduate-level credit as Jpn 521 and may be taken only once for credit. .

## Jpn 422 - Traditional Japanese Drama (4)

An introduction to the classical forms of no kyogen, bunraku and kabuki. Students read plays and view videos of plays in performance, analyzing themin their historical, social, and performance contexts. Students have the option of performing short dances of plays in a class recital. Conducted in English.

Also offered for graduate-level credit as Jpn 522 and may be taken only onceforcredit.

## Jpn 423 - Introduction to Modern Japanese Poetry (4)

An introduction to modern Japanese poetry including new forms (shi) and modern variations on traditional forms (tanka, haiku). Students read poems in Japanese, analyze syntax, learn genre requirements, and understand the history of modern Japanese poetry.

Also offered for graduate-level credit as Jpn 523 and may be taken only once forcredit. .Prerequisite: Jpn 411 or 412; Jpn 302 with permission of instructor.

## Jpn 424 - Contemporary Japanese Poetry and Pop Culture (4)

An introduction to contemporary Japanese popculture including free verse, traditional tanka, songlyrics, and comic books (manga). Students read verse in Japanese, analyze syntax, learn genre requirements, and understand the history of modern Japanese poetry and songs; students
analyze sequential-art narratives to understand multiple as pects of Japanese pop culture.

Also offered for graduate-level credit as Jpn 524 and may be taken only once for credit. . Prerequisite: Jpn 411 or Jpn 412.

Jpn 477 - Teaching Japanese As a Foreign Language (4)

Principles of instructional methods in teaching Japanese to speakers of languages whose orthography is not Kanjibased. Readings in language pedagogy, particularly the pedagogy of non-Indo-European languages. Students are required to teach and observe classes in an approved Japanese program. This is the first course in a sequence of two: Jpn 477 and Jpn 478. Expected preparation: Ling 390, Jpn 303.

Also offered for graduate-level credit as Jpn 577 and may be taken only once for credit. .

## Jpn 478 - Teaching Japanese As a Foreign Language (4)

Principles of instructional methods in teaching Japanese to speakers of languages whose orthography is not Kanjibased. Readings in language pedagogy, particularly the pedagogy of non-Indo-European languages. Students are required to teach and observe clas ses in an approved Japanese program. This is the second course in a sequence of two: Jpn 477 and Jpn 478. Expected preparation:Ling 390, Jpn 303.

Also offered for graduate-level credit as Jpn 578 and may be taken only once for credit. .

## Jpn 494 - Japanese Sociolinguistics (4)

Study of the key concepts that characterize Japanese language and culture, along with empirical analys is of Japanese communication style. Expected preparation: Jpn 302.

Also offered for graduate-level credit as Jpn 594 and may be taken only once for credit. .

Jpn 501 - Research (1-8)
(Credit to be arranged.)

## Jpn 502 - Independent Study (1-4)

(Credit to be arranged.)

Jpn 503 - Thesis (1-12)
(Credit to be arranged.)

## Jpn 504 -Cooperative Education/Internship (1-12)

(Credit to be arranged.)

## Jpn 505 -Reading and Conference (1-8)

(Credit to be arranged.)

## Jpn 507 -Seminar (1-12)

(Credit to be arranged.)

Jpn 508-Workshop(1-8)
(Credit to be arranged.)

## Jpn 509 - Practicum(1-12)

(Credit to be arranged.)

## Jpn 510 -SelectedTopics (1-12)

(Credit to be arranged.)

## Jpn 511 - Advanced Japanese (4)

Development of oral communication, reading, and writing skills with complex patterns in informal and formal situations. This is the first course in a sequence of two: Jpn 511 and Jpn 512.

Also offered for undergraduate-levelcredit as Jpn 411 and may be taken only once for credit.

## Jpn 512 - Advanced Japanese (4)

Development of oral communication, reading, and writing skills with complex patterns in informal and formal situations. This is the second course in a sequence of two: Jpn 511 and Jpn 512.

Also offered for undergraduate-level credit as Jpn 412 and may be taken only once for credit.

## Jpn 513 - Advanced Japanese: Japanese for the Real World (4)

Development of Japanese language skills necessary in work-settings and for practical use. Completion of Jpn 302 and Jpn 305 or equivalent proficiency level is expected.
Also offered for undergraduate-levelcredit as Jpn 413 and may be taken only once for credit. Prerequisite: Jpn 302 and Jpn 305 or equivalent proficiency.

## Jpn 514 - Advanced Japanese Grammar (4)

A systematic approach to the study of Japanese grammar for advanced students and majors, and for teachers.
Also offered for undergraduate-level credit as Jpn414 and may be taken only once for credit. .

Jpn 520 - Readings in Japanese Literature (4)
Reading, analysis, translation, and discussion of representative literary texts. Jpn 420/520 will focus on premodern literature, Jpn 421/521 on literature from the Meiji Period to the present. Conducted primarily in Japanese. This is the first course in a sequence of two: Jpn 520 and Jpn 521.
Also offered for undergraduate-level credit as Jpn420 and may be taken only once for credit. .

## Jpn 521 - Readings in Japanese Literature (4)

Reading, analysis, translation, and discussion of representative literary texts. Jpn 420/520 will focus on premodern literature, Jpn 421/521 on literature from the Meiji Period to the present. Conducted primarily in Japanese. This is the second course in a sequence of two: Jpn 520 and Jpn 521.
Also offered for undergraduate-level credit as Jpn421 and may be taken only once for credit. .
Jpn 522 - Traditional Japanese Drama (4)
An introduction to the classical forms of no kyogen, bunraku and kabuki. Students read plays and view videos of plays in performance, analyzing themin their historical, social, and performance contexts. Students have the option of performing short dances of plays in a class recital. Conducted in English.
Also offered for undergraduate-level credit as Jpn422 and may be taken only once for credit.

Jpn 523 - Introduction to Modern Japanese Poetry (4)
An introduction to modern Japanese poetry including new forms (shi) and modern variations on traditional forms (tanka, haiku). Students read poems in Japanese, analyze syntax, learn genre requirements, and understand the history of modern Japanese poetry.
Also offered for undergraduate-level credit as Jpn 423 and may be taken only once for credit. . Prerequisite: Jpn 411, Jpn 412, or Jpn 413 or graduate standing.
Jpn 524 - Contemporary Japanese Poetry and Pop Culture (4)

An introduction to contemporary Japanese popculture including free verse, traditional tanka, song lyrics, and comic books (manga). Students read verse in Japanese, analyze syntax, learn genre requirements, and understand the history of modern Japanese poetry and songs; students
analyze sequential-art narratives to understand multiple as pects of Japanese pop culture.

Also offered for undergraduate-levelcredit as Jpn 424 and may be taken only once for credit. . Prerequis ite: Graduate standing.

## Jpn 551 - Japanese Language and Literature (4)

In-depth study of a single genre (drama, poetry, or prose). Genre and approach (historical survey, period-specific) will vary fromyear to year.

## Jpn 552 - Japanese Language and Linguistics (4)

Comparative study of intellectual approaches to Japanese language and its analysis, including native (kokugo) theories, American structuralism, modern linguistics, and critical theory. Emphasis will vary from year to year.

## Jpn 553 - Critical Approaches to Japanese Language and Literature (4)

Comparative study of intellectual approaches and research of Japanese language or literature, with an emphasis on secondary texts (research). Topics will vary from year to year.

Prerequisite: WLL560 and 4th-year Japanese reading ability and one additional linguis itcs or literature course.

## Jpn 577 -Teaching Japanese As a Foreign Language

 (4)Principles of instructional methods in teaching Japanese to speakers of languages whose orthography is not Kanjibased. Readings in language pedagogy, particularly the pedagogy of non-Indo-European languages. Students are required to teach and observeclas ses in an approved Japanese program. This is the first course in a sequence of two: Jpn 577 and Jpn 578.
Also offered for undergraduate-levelcredit as Jpn 477 and may be taken only once for credit. .

## Jpn 578 - Teaching Japanese As a Foreign Language

 (4)Principles of instructional methods in teaching Japanese to speakers of languages whose orthography is not Kanjibased. Readings in language pedagogy, particularly the pedagogy of non-Indo-European languages. Students are required to teach and observeclas ses in an approved Japanese program. This is the second course in a sequence of two: Jpn 577 and Jpn 578.

Also offered for undergraduate-levelcredit as Jpn 478 and may be taken only once for credit. .

## Jpn 594 - Japanese Sociolinguistics (4)

Study of the key concepts that characterize Japanese language and culture, along with empirical analys is of Japanese communication style.
Also offered for undergraduate-level credit as Jpn 494 and may be taken only once for credit. .

## JSt - Judaic Studies

## JSt 201 - Introduction to Judaism (4)

Traces the development of Judaismas a religious system and civilization from the biblical period through the middle ages and into the modern era. Describes the practices and beliefs of Judaismas a lived religion primarily through the investigation of primary sources.

## JSt 299-Special Studies (1-4)

(Credit to be arranged.)

## JSt 311 - Introduction to the New Testament (4)

We will study the diverse writings of the New Testament as products of their original his torical, social, and religious contexts. We will ask how these ancient writings came to be written, collected and preserved and how they served to interpret and respond to the life situations of the earliest Christians. This course may be repeated once for credit.

Cross-Listed as: This is the s ame course as Hst 311.

## JSt 317U - Jewish History from Antiquity to the

 Medieval Period (4)Introduces students to the Jewish his torical experience from its Biblical origins through theend of the first millennium CE primarily by means of close readings of primary sources. Describes the diverse forms of Jewish life underPersian, Greco-Roman, Early Christian and Muslim rule and examines the boundaries of pre-modern Jewish cultural and religious identity. This is the same course as Hst 317U and may be taken only once for credit.
Cross-Listed as:Hst 317U.

## JSt 318U - Jewish History from the Medieval Period to the Present (4)

Survey of Jewish history fromthe year 1000 to the present, covering major developments in Jewish society and culture in the medieval Islamic and Christian realms, early modem Europe and the Middle East, and the modern world. Topics include religious thought, communal and political structures, and Jewish/non-Jewish relations. This is the same course as Hst 318U and may be taken only once for credit.

Cross-Listed as: Hst 318U.

## JSt319U- Rabbinic Culture in the Roman World(4)

Introduction to history and literature of the rabbinic movement in Roman Palestine, 70 CE- 500 CE. Origins of the rabbis, their role in society, genres of rabbinic literature (Mishnah, Talmud, Midrash), rabbinic law and theology and rabbinic attitudes towards the urban culture of the Roman Near East. This is the same course as Hst319U and may be taken only once for credit.

Cross-Listed as: Hst 319U.

## JSt 324U- Historical Introduction to the Hebrew Bible/OldTestament (4)

Historical survey of Hebrew Bible/Old Testament. Investigates Israelite religion in the context of the Ancient Near East, exploring ideas about community, sanctity, social justice, prophesy, wis dom, and the nature of human suffering.

## JSt 325U- Retelling the Bible (4)

Discusses how the Bible was read in antiquity. Surveys the genres of early Jewish Biblical interpretation, including inter-Biblical interpretation, rewritten Bible, translation, allegory, allusion. Sources include the Apocrypha and Pseudepigrapha, the Dead Sea Scrolls, Greco-Jewish literature and Rabbinic Midrash

## JSt 333U - Israeli Culture and Society (4)

Inves tigates the foundation and development of an Is raeli nationalculture and its role in shaping contemporary Israeli society. Explores how history, politics, gender, religion, and ethnicity operate in the public arena. Key topics include myth and memory, public and stateevents, music and dance, theater and architecture. No prerequisites required.

## JSt 335U- Sex, Love, and Gender in Israel (4)

Examines intersections of gender and nationalism; the role of masculinity; conceptions of femininity, sex, love, and motherhood; and the impact of gender on the Arab-Is raeli conflict. Investig ates the history and experiences of a diverse array of women in Is rael, including Jewish women, Israeli Arab and Palestinian women, and foreign workers.

## JSt 372 - History of Antisemitism (4)

Surveys the development of hostility towards Jews from antiquity to the present day. We will explore how antiJewish hatred has persisted over millennia even as it has adapted to individual his torical and geographic contexts.

Topics include anti-Jewishbias in the ancient world and foundationalChristian sources; social and economic marginalization in medieval Europe; the emergence of political and racial antisemitismin the nineteenth century; Nazi antisemitism; and contemporary developments, including left-and right-wing antisemitis $m$.

Cross-Listed as: This is the same course as Hst 372 and may be taken only once for credit.

## JSt 378U - Pagans, Christians andJews (4)

Discusses the development and interaction of Roman paganism, Christianity and Judaismduring the period of Late Antiquity. Topics will include education, philosophy, asceticism, ritual, religious law, the image of the holy man and the phenomenon of religious polemic in the Later Roman Empire (c. 250-600 CE). This is the same course as Hst 378U and may be taken only once for credit.
Cross-Listed as:Hst 378U.

## JSt 379U - History of Zionism (4)

Zionismas ideology and practice in context of Jewish and European history. Includes society and culture Zionism created under the British mandate of Palestine, roots of the Arab-Jewish conflict in this context, and impact on Jewish life and politics in Eastern and Central Europe and the United States.This is the same course as Hst 379U and may be taken only once for credit.
Cross-Listed as:Hst 379U.

## JSt 380U - The Holocaust (4)

An introduction to the Nazi-planned and -executed genocide of European Jewry known as the Holocaust. Topics includes the German and European contexts for the rise of Nazism; antisemitismand its links to Nazi ideology and policy; European Jewry in the interwar period; the "Final Solution"; resistance and collaboration. This is the same course as Hst 380U and may be taken only once for credit.

Cross-Listed as:Hst 380U.

## JSt 381U - Kabbalah: The Jewish Mystical Tradition

 (4)Surveys the origins and development of the Jewish mystical tradition set against the context of Jewish religious, social, and intellectual his tory. Topics include mystical visions in ancient Jewish texts, medieval Kabbalah and the Zohar, the Sabbatean mes sianic movement, Hasidism, and contemporary uses of Kabbalah. This is the same course as Hst 381 U and may be taken only once for credit.
Cross-Listed as:Hst 381U.

## JSt 388U - History of Modern Israel (4)

Surveys the evolution of modern Israel, exploring social, political, cultural, and intellectual developments from 1880 to the present. Topics include theemergence of the Zionist movement; political, cultural, and social developments before and after 1948; the Arab-Israeliconflict; and the social framework of Is raeli society.

## JSt 399 - Special Studies (1-4)

(Credit to be arranged.)

## JSt 401 - Research (0-6)

(Credit to be arranged.)

## JSt 402 - Independent Study (1-12)

(Credit to be arranged.)

## JSt 404 - Cooperative Ed/Internship (1-12)

(Credit to be arranged.)

## JSt 405 - Reading and Conference (0-6)

(Credit to be arranged.)

## JSt 407 -Seminar (1-4)

(Credit to be arranged.)

## JSt 407H-Seminar (1-4)

## JSt 409 - Practicum(1-8)

(Credit to be arranged.)

## JSt 410 -Special Topics (1-4)

(Credit to be arranged.)

## JSt 430 - Messiahs and Messianism (4)

Messianic ideas in Judais mand other religions. Can focus on specific messiah figures and movements, comparative messianis ms, his torical and conceptual development of messianic idea, and/or modern manifestations. Repeatable once with departmental approval.

Prerequisite: 8 upper division credits in Judaic Studies, or related courses with permission of ins tructor.

## JSt 431 - The Arts and the Jewish Experience (4)

Examines the connection between Jewish culture and the visual, literary, and/or performing arts. Investigates the diversity of Jewish experience, the formation of Jewish identity, and the interpretation of Jewish arts through lectures, works hops with artists, and attendance of events such as films, exhibits, readings, and/or performances.
Prerequisite: Upper-division standing.

## JSt 435 - Jewish and Israeli Dance History (4)

Examines the development of Jewish and Is raeli dance in the twentieth century. Exploring social and concert dance forms, topics include the development of Is raeli folk dance; works of American Jewish choreographers such as Fiddler on the Roof; the Batsheva Dance Company, Ethiopian and Yemenite Jewish dance companies in Is rael.
Prerequisite: upper-division standing.
Kor - Korean
Kor 101 - First-Year Korean Term 1 (5)
An introduction to the Korean language with emphasis on listening comprehension, speaking, elementary reading and writing, and grammatical patterns. This is the first course in a sequence of three: Kor 101, Kor 102, and Kor 103.

## Kor 101H-1st Year Korean Heritage ()

An introduction to the Korean language with emphasis on listening comprehension, speaking, elementary reading and writing, and grammatical patterns.

Kor 102 - First-Year Korean Term 2 (5)
An introduction to the Korean language with emphasis on listening comprehension, speaking, elementary reading and writing, and grammatical patterns. This is the second course in a sequence of three: Kor 101, Kor 102, and Kor 103.

## Kor $\mathbf{1 0 2 H}-1$ 1st Year Korean Heritage ()

An introduction to the Korean language with emphasis on listening comprehension, speaking, elementary reading and writing, and grammatical patterns.

## Kor 103 - First-Year Korean Term 3 (5)

An introduction to the Korean language with emphasis on listening comprehension, speaking, elementary reading and
writing, and grammatical patterns. This is the third course in a sequence of three: Kor 101, Kor 102, and Kor 103.

## Kor 103H-1st Year Korean Heritage ()

An introduction to the Korean language with emphasis on listening comprehension, speaking, elementary reading and writing, and grammatical patterns.

## Kor 199-Special Studies (1-12)

(Credit to be arranged.)

## Kor 201 -Second-Year Korean Term 1 (5)

Continued work in the Korean language with emphasis on listening comprehension, speaking, reading and writing, and grammatical patterns. This is the first course in a sequence of three: Kor 201, Kor 202, and Kor 203. Recommended prerequisite: Kor 103.

## Kor 201H-2nd Year Korean Heritage ()

Continued work in the Korean language with emphasis on listening comprehension, speaking, reading and writing, and grammatical patterns.

## Kor 202 -Second-Year Korean Term 2 (5)

Continued work in the Korean language with emphasis on listening comprehension, speaking, reading and writing, and grammatical patterns. This is the second course in a sequence of three: Kor 201, Kor 202, and Kor 203. Recommended prerequisite: Kor 103.

## Kor 202H-2nd Year Korean Heritage ()

Continued work in the Korean language with emphasis on listening comprehension, speaking, reading and writing, and grammatical patterns.

Kor 203 - Second-Year Korean Term 3 (5)
Continued work in the Korean language with emphasis on listening comprehension, speaking, reading and writing, and grammatical patterns. This is the third course in a sequence of three: Kor 201, Kor 202, and Kor 203. Recommended prerequisite: Kor 103.

## Kor 203H-2nd Year Korean Heritage ()

Continued work in the Korean language with emphasis on listening comprehension, speaking, reading and writing, and grammatical patterns.

Kor 299 - Special Studies (1-12)
(Credit to be arranged.)

## Kor 301 - Third-Year Korean Term 1 (4)

Continued work in the Korean language in a widening variety of contexts. 301 emphasizes listening and speaking skills; 302 reading, writing, and vocabulary de velopment. This is the first course in a sequence of two: Kor 301 and Kor 302. Recommended prerequisite: Kor 203.

## Kor 302 - Third-Year Korean Term 2 (4)

Continued work in the Korean language in a widening variety of contexts. 301 emphasizes listening and speaking skills; 302 reading, writing, and vocabulary development. This is the second course in a sequence of two: Kor301 and Kor 302. Recommended prerequisite: Kor 203.

## Kor 330U - Topics in Korean Culture and Civilization

 (4)A multimedia survey of development and trends of Korean culture in modern Korea. Examines various forms of its culture-including rituals, traditions, art, music, cinema, entertainment, mass media, food, and the Internet - and studies their implications in social, political, historical, and economical contexts. Conducted in English.

## Kor 361 - Korean Culture \& Society Through Film (4)

Introduces salient elements of traditional and contemporary Koreaby means of watching and discussing selected Korean movies that offer rich cultural and historical contexts. Examines how the creators of the movies interpret and represent themin their work. Taught in English.

Kor 399 - Special Studies (1-12)
(Credit to be arranged.)

Kor 399U- Special Studies (4)
(Credit to be arranged.)

## Kor 404 - Cooperative Education/Internship (1-12)

(Credit to be arranged.)

Kor 409 - Practicum (1-6)
(Credit to be arranged.)

Kor 410 -Selected Topics (1-12)
(Credit to be arranged.)

## Lat - Latin

Lat 101 - First-Year Latin Term 1 (4)
An introduction to elementary Latin. Emphas is on the elements of grammar, vocabulary building, and elementary readings. This is the first course in a sequence of three: Lat 101, Lat 102, and Lat 103.

## Lat 102 - First-Year Latin Term 2 (4)

An introduction to elementary Latin. Emphas is on the elements of grammar, vocabulary building, and elementary readings. This is the second course in a sequence of three: Lat 101, Lat 102, and Lat 103.

Lat 103 - First-Year Latin Term 3 (4)
An introduction toelementary Latin. Emphas is on the elements of grammar, vocabulary building, and elementary readings. This is the third course in a sequence of three: Lat 101, Lat 102, and Lat 103.

Lat 199 -Special Studies (1-12)
(Credit to be arranged.)

## Lat 201 -Second-Year Latin Term 1 (4)

Intensive review of basic materials introduced in first-year programand further development of reading skills. This is the first course in a sequence of three: Lat 201, Lat 202, and Lat 203. Expected preparation: Lat 103.

## Lat 202 -Second-Year Latin Term 2 (4)

Intensive review of basic materials introduced in first-year programand further development of reading skills. This is the second course in a sequence of three: Lat 201, Lat 202, and Lat 203. Expected preparation: Lat 103.

## Lat 203 -Second-Year Latin Term 3 (4)

Intensive review of basic materials introduced in first-year programand further development of reading skills. This is the third course in a sequence of three: Lat 201, Lat 202, and Lat 203. Expected preparation:Lat 103.

Lat 299 - Special Studies (1-12)
(Credit to be arranged.)


#### Abstract

Lat 301 - Third year Latin: Authors of Republican Rome (4)

Close reading of one text, prose or poetry, with special attention on syntax, style, and cultural milieu. Some Latin composition modelled on author possible. This is the first course in a sequence of three: Lat 301, Lat 302, and Lat 303. Expected preparation: Lat 203. Repeatable with change of text.


## Lat 302 - Third-year Latin: Authors of Imperial Rome

 (4)Close reading of one text, prose or poetry, with special attention on syntax, style, and cultural milieu. Some Latin composition modelled on author possible/. This is the second course in a sequence of three: Lat 301, Lat 302, and Lat 303. Expected preparation: Lat 301. Repeatable with change of text.

## Lat 303 - Third-year Latin: Post-classical Authors (4)

Close reading of one text, or series of texts, prose or poetry, with special attention on syntax, style, and cultural milieu. Some paleographic work with digitized manuscripts. This is the third course in a sequence of three: Lat 301, Lat 302, and Lat 303. Expected preparation: Lat 302. Repeatable with change of text.

## Lat 330U- Roman Culture (4)

A survey of daily life in ancient Rome, including Roman families, religious practices, entertainment, political life, arts and architecture. Conducted in English.

## Lat 341U- Roman Literature in Translation (4)

A survey of Roman literature fromthe Republic through the Empire, including readings in Virgil, Plautus, Ovid, Cicero, and Catullus. Conducted in English.

## Lat 399-Special Studies (1-6)

(Credit to be arranged.)

## Lat 401 -Research (1-6)

(Credit to be arranged.)

Lat 404 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

## Lat 407 -Seminar (1-6)

(Credit to be arranged.)

## Lat 409-Practicum(1-12)

(Credit to be arranged.)

## Lat 410 -Selected Topics (1-6)

(Credit to be arranged.)

## Lib - Library

## Lib 181 - Use of the Library (3)

Initial training in the effective use of the University library and resources, such as the card catalog, reference materials, and electronic res ources, including the on-line datalog, CDROM databases, and Internet.

## Lib 199 -Special Studies (1-8)

Credit to be arranged.

## Lib 299 -Special Studies (1-8)

Credit to be arranged.

## Lib 399 -Special Studies (1-8)

Credit to be arranged.

## Lib 401 -Research (1-6)

(Credit to be arranged.)

## Lib 402 - Independent Study (1-12)

(Credit to be arranged.)

## Lib 403 - Thesis (1-6)

(Credit to be arranged.)

## Lib 404 - Cooperative Education/Internship (1-12) <br> (Credit to be arranged.)

## Lib 405 - Reading and Conference (1-6)

(Credit to be arranged.)

## Lib 406 -Special Problems (1-6)

(Credit to be arranged.)

Lib 407 -Seminar (1-6)
(Credit to be arranged.)

## Lib 408 - Workshop(1-6)

(Credit to be arranged.)

## Lib 409-Practicum(1-12)

(Credit to be arranged.)

## Lib 410 - Experimental Course (1-6)

(Credit to be arranged.)

## Lib 428 - Children's Literature, K-5 (3)

Materials grades K-5. Traditionalgenres such as picture books, traditional tales, modern realism, romance, adventure, mystery, his torical fiction, science fiction, fantasy, biography, poetry, and nonfiction. Study of literature that illus trates cultural diversity. Resources for selection; awards and honors.

Also offered for graduate-levelcredit as Lib 528 and may be taken only once for credit. .Prerequisite: junior standing.
Lib 429 - Young Adult Literature (3)
Analyze young adult literature (YAL) and study trends and styles in YAL. Discuss fictional and informational texts,
digital, and online res ources, graphic novels, and other materials featuring authors and illustrators who dominate the YAL landscape.
Also offered for graduate-level credit as Lib 529 and may be taken only once for credit.

## Lib 432 - Multicultural Literature K-12 (3)

An introduction to contemporary multicultural literature, fiction and nonfiction, for use with early childhood, elementary, middle school and high school students. Emphas is is on the selection, evaluation, and utilization of literature in the clas sroom and library media center.
Also offered for graduate-level credit as Lib 532 and may be taken only once forcredit.
Lib 433 - Global Literature: K-12 (3)
A survey of global literature for use with students in elementary, middle, or high school clas srooms. A major focus will be on selecting reading materials and using them in the library and clas sroom.

Also offered for graduate-level credit as Lib 533 and may be taken only once for credit.

## Lib 501 - Research (1-9)

(Credit to be arranged.)

## Lib 502 - Independent Study (1-12)

(Credit to be arranged.)

## Lib 503 -Thesis (1-9)

(Credit to be arranged.)

## Lib 504 - Cooperative Education/Internship (1-12)

(Credit to be arranged.)

## Lib 505 - Reading and Conference (1-6)

(Credit to be arranged.)

## Lib 506-Special Problems (1-6)

(Credit to be arranged.)

## Lib 507 -Seminar (1-6)

(Credit to be arranged.)

## Lib 508 - Workshop(1-6)

(Credit to be arranged.)

## Lib 509 - Practicum (1-9)

(Credit to be arranged.)

## Lib 510 - Experimental Course (1-6) <br> (Credit to be arranged.)

## Lib 528 - Children's Literature, K-5 (3)

Materials grades K-5. Traditional genres such as picture books, traditional tales, modern realism, romance, adventure, mystery, his toricalfiction, science fiction, fantasy, biography, poetry, and nonfiction. Study of literature that illus trates cultural diversity. Res ources for selection; awards and honors.
Also offered for undergraduate-level credit as Lib 428 and may be taken only once for credit. .

## Lib 529 - Young Adult Literature (3)

Analyze young adult literature (YAL) and study trends and styles in YAL. Discuss fictional and informational texts, digital, and online resources, graphic novels, and other materials featuring authors and illus trators who dominate the YAL landscape.
Also offered for undergraduate-level credit as Lib 429 and may be taken only once for credit.

## Lib 530 - Literature Promotion Programs, K-12 (3)

A study of techniques for promoting literature in elementary and secondary schools: author/illustrator studies, reading books aloud, storytelling, booktalks, reading promotion programs, and incorporating literature throughout the curriculum.
Prerequisite: Lib 428/528.

## Lib 532 - Multicultural Literature K-12 (3)

An introduction to contemporary multicultural literature, fiction and nonfiction, for use with early childhood, elementary, middle school and high school students. Emphasis is on the selection, evaluation, andutilization of literature in the clas sroom and library media center.

Also offered for undergraduate-level credit as Lib 432 and may be taken only once for credit.
Lib 533 - Global Literature: K-12 (3)
A survey of global literature for use with students in elementary, middle, or high school clas srooms. A major
focus will be on selecting reading materials and using them in the library and classroom.
Also offered for undergraduate-levelcredit as Lib 433 and may be taken only once for credit.

## Lib 534 - Administration of the School Library (3)

Study of the school library and its integral role in the instructional programof the school and the school library media movement. Focus on the leadership role of the school librarian, management of pers onnel, program budgeting, facility planning, role of state and national standards in planning, evaluation, and development; other administrative areas. Field activities included.
Prerequisite: Lib 528.

## Lib 536 - Instructional Design and Technology for Schools \& Libraries (3)

Study the use of instructional media for K - 12 including instructional design and criteria for quality print and nonprint media. Learn graphic techniques and uses of computers andtechnology in production of instructional media. Research current practices in library and clas sroom instruction and communication.

## Lib 541 - Reference and Information Systems and Services (3)

An analysis of reference services and procedures. Study of print, nonprint, and electronic database reference sources to include bibliographic tools, indexes, encyclopedias, ready references, biographical tools, geographical tools, dictionaries, government documents, and specialized materials. Research in reference services and technological delivery systems.
Prerequisite:Lib 428/528.

## Lib 542 -Collection Development and Evaluation (3)

Principles and practice of evaluation, selection, and acquisition of all types of materials included in a school library collection. Selection and collection development policies and procedures. Study of professionalevaluation and selection sources. Field activities included.
Prerequisite:Lib 428 orLib 528.
Lib 547 -School Library Instructional Programs, K-12 (3)

A study of the K-12 information skills program, including the development of a scope and sequence, effective teaching strategies, specific skills instruction, correlation and integration with the classroom curriculum, and organization and development of a teaching programin the school library media center.
Prerequisite:Lib 528.

## Lib 548 - Cataloging and Organization of School Library Collections (3)

Principles of organization of school library collections. Basic cataloging procedures for print, nonprint, and electronic forms of media using standard cataloging and classification codes. Application of online cataloging databases.
Prerequisite:Lib 428/528.

## Lib 554 - Student Teaching I (6)

Beginning studenteaching in a library media center under the direction of a supervis ing library media teaching and university supervis or. Observation and participation in teaching, administrative and other res ponsibilities of a library media specialist. Opportunities for in volvement in studentlearning activities, development of teaching skills, bas ic skills in management and dis cipline of students.
Prerequisite: admis sion to the programand approved application.

## Lib 555 - Student Teaching II (15)

Ten weeks of full-time student teaching in a school library media centerunder the supervision of a library media teacher and university supervisor. Participation in a full range of teaching, administrative, and other responsibilities of a library media specialist. Direct responsibilities for student learning activities, development of teaching skills, creating a climate conducive for learning; manage ment and discipline of students, and related professional activities. Weekly seminar.
Prerequisite: admis sionto programand approved application.

## Lib 561 -School Library Practicum: Hementary (3)

A planned experience consisting of practical application of the full range of roles and responsibilities of the School Librarian in an elementary school library under the direction of a supervising elementary school library teacher and a University supervisor.
Prerequisite: admis sionto Educational Media Endorsement Program.

## Lib 562 -School Library Practicum: Secondary (3)

A planned experience consisting of practical application of the full range of roles and responsibilities of the School Librarian in a secondary school library under the direction of a supervising secondary school library teacher and a University supervis or.
Prerequisite: admis sion to the SchoolLibrary Endorsement Program.

## Lib 573 -Advanced Methods and Procedures in School Library/Media Centers (3)

A study of the school library/media center as a teaching agency. Designed to focus on the teaching role of the school librarian/media specialist in presenting concepts, principles, content, and techniques to students and teachers. Emphasis placed on instruction in library and research skills; reading, viewing and listening guidance; in-service for school personnel; and problems involved in performing effectively as a teacher. Observation of library/media centers required.

Prerequisite: Educational Media Endorsement or consent of instructor.

## Lib 574 - Research Strategies for Library Media Specialists (3)

Advanced reference materials available in school and academic libraries, including computer databases and network resources.

Prerequisite: Educational Media Endorsementor consent of instructor.

## Lib 575 -Directed Field Experience (3)

Planned contact for school library media specialists with profes sional librarians and/or media specialists in public, academic, special libraries, information centers, and other library or media- related settings. Directed field work and visitations to various libraries and information centers will be the emphas is of the course. Seminar meetings on campus deal with topics related to the field experience as well as intensive study of related ad vanced issues such as automation, personnel, and management.
Prerequisite:Educational Media Endorsementorconsent of instructor.

## Lib 576 - Planning and Evaluation of Library Media Programs (3)

Analysis of media center programs and planning techniques; study and application of media center evaluation instruments; analysis and development of library media center programs.
Prerequisite: Educational Media Endorsement or consent of instructor.

## Lib 587 - Video Production (3)

Study and practice video production techniques, including storyboarding, camera techniques, editing, and preparing video for various educational settings. Design activities that engage students in digital video production and produce videos for library or clas sroomuse.

## Lib 588-21st Century Technologies for Educators (3)

Analyze the role of computers and advanced technology in the library media center and classroom. Focus on new and emerging technologies to enhance classroominstruction for all learners. Develop curricula thateffectively use media and technology to engage and support students.

## Lib 589 - Creative Photography in Education (3)

A study of photographic processes to include photography without a camera, basic animation techniques, and darkroomtechniques. Analysis of completed photographs in terms of composition, style, and technique will also be studied. All techniques will be related to clas sroom instruction in the elementary and secondary schools.

Prerequisite:Lib 536 or consent of instructor.

## Lib 592 - Contemporary Children's and Young Adult Literature (3)

An analysis and study of contemporary children's and young adult literature. A study of trends and styles in modern literature. Includes picture books, fiction, and nonfiction. Contemporary authors and illustrators featured.
Prerequisite:Lib 428/528 or equivalent.

## Lib 601 - Research (1-9)

(Credit to be arranged.)

## Lib 602 - Independent Study (1-9)

(Credit to be arranged.)

## Lib 603 -Dissertation (1-9)

(Credit to be arranged.)

## Lib 604 - Cooperative Education/Internship (1-9) <br> (Credit to be arranged.)

Lib 605 - Reading and Conference (1-9)
(Credit to be arranged.)

## Lib 606 -Special Problems (1-9)

(Credit to be arranged.)

Lib 607 -Seminar (1-9)
(Credit to be arranged.)

Lib 608 - Workshop(1-9)
(Credit to be arranged.)

## Lib 609 - Practicum(1-9)

(Credit to be arranged.)

## Lib 610 -SelectedTopics (1-9)

(Credit to be arranged.)

## Lib 801 -Research (0-9)

(Credit to be arranged.)

## Lib 802 - Independent Study (0-9)

(Credit to be arranged.)

## Lib 804 -Cooperative Education/Internship (0-9)

(Credit to be arranged.)

## Lib 805 - Reading and Conference (0-9)

(Credit to be arranged.)

## Lib 806 -Special Problems (0-9)

(Credit to be arranged.)

## Lib 807 -Seminar (0-9)

(Credit to be arranged.)

## Lib 808 - Workshop(0-9)

(Credit to be arranged.)

## Lib 809 - Practicum(0-9)

(Credit to be arranged.)

## Lib 810 -Experimental Course (0-9)

(Credit to be arranged.)

## Ling - Applied Linguistics

## Ling 115 -Writing Workshopfor Non-native Writers

 (4)Designed for writers whose first language is not English to develop their skills and confidence in writing for college. Focuses on therhetorical structures of American Collegelevel academic writing including es say structure, summaries, responses, and research writing. In addition, students work on grammar and sentence structure problems which occur more often in non-native writing and do peer editing and self-editing. Understanding complex assignments, synthesizing ideas, and strategies for test taking are also addressed.

## Ling 151 -Grammar Level 5 (Advanced) (3)

A quick review and expansion of perfective verb forms, subordination/coordination of structures, and conditionals; an introduction to subjunctive, fronting and inversion of structures. Emphasis is on usage, particularly in editing, academic writing and oral presentations.

## Ling 161 -Language Proficiency Test Preparation (4)

This course prepares students to take IELTS, TOEFL iBT, or the Institutional TOEFL. Students select and set goals to achieve their desired test score. Students follow a flexible, personalized study plan to improve weaknesses while enhancing overall performance. Students make use of multiple learning tools available in the IELP Learning Center, consult with trained testing tutors, and work closely with the instructor.

## Ling 182 -Social Media: Interacting Online (4)

Students develop computer communication skills by examining and researching the social aspect of the Internet. Explore and examine the use of social media and its importance in society. Participate in weekly online discussions and create individual blogs.

## Ling 183 -Community Reporting (4)

Students explore American culture at PSU and in the Portland community by creating a class newsletter. Focus on interviewing and reporting techniques, writing and revising articles, and developing proofreading andediting skills. Students select articles and design the layout.

## Ling 184 - Cultural Themes in Reading (4)

Students develop reading skills, cultural knowledge, and communicative ability by reading and discussing authentic,
unabridged texts. Improve critical thinking and discussion skills through writing and answering questions, paraphrasing and relating ideas, and delivering presentations. Cultural themes rotate each term.

## Ling 185 - Practically Speaking: Conversational English (4)

Students improve conversational fluency by learning strategies for oral communication and focusing on common words and phrases used in spoken American English.Learn about the cultural knowledge required to navigateeveryday interactions. Improve pronunciation and practice speaking in authentic situations.

## Ling 186 - Communication through Volunteering (4)

This course provides community and classroom opportunities for the development of oralcommunication skills, critical thinking, and intercultural competence. Experience Portland culture and practice communication strategies through group projects with PSU students, elementary schools, and other community partners.

## Ling 187 - Multimedia Listening (4)

Students expand their listening skills and increase their familiarity with American culture through a wide variety of sources such as music, movies, TV shows, Internet videos, radio programs, extended conversations, and live entertainment. Cultural themes rotate each term.

## Ling 199 -Special Studies (0-12)

See department for course description. (Credit to be arranged.)

## Ling 232 - Language and Society (4)

General introduction to what languages are like, how they are used and how they vary, focusing on how language interacts with society and culture. Some questions that will be addressed include: Why doesn't everyone speak the same language? Do men and women talk differently? What is the relationship between endangered species and endangered languages? How does language influence our thoughts or behaviors?

## Ling 233 - Language and Mind (4)

General introduction to what languages are like, how they are used, and how they vary, focusing onhow language is learned and produced. Some questions that will be
addressed include: Is language innate? Is it unique to humans? How is language related to thought or to culture? How is language represented in the brain? How is language acquired in different cultures and different circums tances?

## Ling 299 -Special Studies (1-4)

See department for course description. (Credit to be arranged.)

## Ling 301 - Introduction to Native American Languages (4)

General introduction to the linguistic and cultural background of endangered native languages of North America. Topics include structure of native languages; relationship of language to other as pects of culture such as worldview, social org anization, and story telling; history of language change and current tribal projects to revitalize native languages.

## Ling 332U- 'Do I talk wrong?' Language Myths in the USA (4)

The nature of language and language myths to s how how opinion and unexamined biases about language develop into language ideologies and, subsequently, shape language policy and US A merican culture.

## Ling 334U- "You have the right to remain silent.": Language and the Law (4)

Linguistic theory and practices used to provide evidence for the justice system.

## Ling 390 - Introduction to Linguistics (4)

A general introduction to the study of linguistics, including a basic survey of phonology, morphology, syntax, and semantics, brief overview of other topics such as language acquisition and language in social contexts, a brief sketch placing English in historical pers pective, and a preliminary examination of principles in modern language study.

## Ling 391 - Introduction to Applied Linguistics (4)

An introduction to core areas of applied linguistics, giving students experience with analyzing and writing about linguistic data using conventions that are typically expected in the field, both in terms of APA reference formatting and research article structure. Specific topics include language acquisition and discourse analysis.
Prerequisite: Ling 390 or Span 494.

## Ling 392 - Structure of the English Language (4)

A study of basic English grammar with an emphasis on describing grammatical forms and their functions in communication. Expected preparation or co-requisite: Ling 390.

## Ling 399 - Special Studies (1-8)

See department for course description. (Credit to be arranged.)

## Ling 401 - Research (1-6)

See department for course description. (Credit to be arranged.)

## Ling 402 - Independent Study (1-12)

(Credit to be arranged.)

## Ling 403 - Honor Thesis (1-4)

(Credit to be arranged.)

## Ling 404 - Cooperative Education/Internship (1-12)

See department for course description. (Credit to be arranged.)

## Ling 405 - Reading and Conference (1-6)

See department for course description. (Credit to be arranged.)

## Ling 406 - Special Projects (1-6)

(Credit to be arranged.)

## Ling 407-Seminar (1-6)

The Senior Seminar, draws together the Applied Linguistics major's various strands and exploits the undergraduate student's linguistic knowledge to explore substantive is sues in the field. The course content will vary from quarter to quarter and has included such topics as "Orality and Literacy", "CriticalLinguistics", and "Language in Cyberspace". In addition, students will be guided in preparing rés umés and CVs for graduate school or jobs. Those students planning on going to graduate school are advised to take the course in Fall Quarter.

Prerequisite: 24 Ling credits at the 400 -level or senior standing or with ins tructor's permis sion.

## Ling 408 - Workshop(1-6)

See department for course description. (Credit to be arranged.)

## Ling 409 - Practicum(1-12)

See department for course description. (Credit to be arranged.)

## Ling 410 -Selected Topics (1-6)

See department for course description. (Credit to be arranged.)

## Ling 411 -Syntax (4)

Introduction to modern grammatical theory, its methods, and findings. Presents patterns of argumentation, models, and bas ic results of research.
Also offered for graduate-level credit as Ling 511 and may be taken only once for credit. . Prerequisite: Ling 390 or Span 494 and one other course in linguistics.

## Ling 412 - Phonology (4)

How sounds pattern and how they are used in the world's languages, how those patterns should be represented, and what theories have been advanced to explain those patterns. Some historical background to the sub-dis cipline and some training in linguistic analysis and argumentation.
Also offered for graduate-level credit as Ling 512 and may be taken only once for credit. Prerequisite: (Ling 390 or Span 494) and Ling 415/Ling 515.

## Ling 414 -Linguistic Pragmatics (4)

A study of current theories of language use, particularly contextual and functional aspects of communication. Expected preparation: Ling 391.

Also offered for graduate-level credit as Ling 514 and may be taken only once for credit. . Prerequisite: Ling 390 or Span 494.

## Ling 415 -Linguistic Phonetics (4)

Introduces the sounds of the world's languages with a concentration on English. Practical exercises designed to develop skills in production, discrimination, and phonetic transcription. Applications to speech technology and speech pathology.
Also offered for graduate-level credit as Ling 515 and may be taken only once for credit. . Prerequisite:Ling 390 or Span 494.

## Ling 416 - Discourse Analysis (4)

The examination of forms and functions in discourse. Using several analytic procedures for understanding how conversation works, especially as applied to language learning and teaching. Expected preparation: Ling 391, Ling 392.
Also offered for graduate-level credit as Ling 516 and may be taken only once for credit. . Prerequisite: Ling 390 or Span 494.

## Ling 417 - Endangered Languages (4)

How and why languages are endangered in the Pacific Northwestand elsewhere in the world. Environmental factors, globalization, and colonization will be evaluated for the roles they have played. Consideration is alsogiven to how dying languages can be maintained or "awakened" (revitalized).
Also offered for graduate-level credit as Ling 517 and may be taken only onceforcredit.

## Ling 418 - Linguistic Morphology (4)

The study of words and word structure. Focuses on analyzing word formation across languages. Examines the relationship between morphology, syntaxand phonology, the theoretical as sumptions that underlie morphological analys is, and some applications of morphological analysis . Expected preparation: Ling 392.
Also offered for graduate-level credit as Ling 518 and may be taken only once for credit. . Prerequisite: Ling 390 or Span 494.

## Ling 419 - Language Typology (4)

Studies and classifies languages according to their structural features. Introduces (structural) linguistics and studies structures across languages. Prepares students for more theoretical and analytical courses in the department. Expected preparation: Ling 391, Ling 392.
Also offered for graduate-level credit as Ling 519 and may be taken only once forcredit. . Prerequisite: Ling 390 or Span 494.

## Ling 420-Historical and Comparative Linguistics (4)

Study of language relationships and language change. Topics include the genetic classification of languages, language and prehistory, methods of his torical reconstruction, and language contact. Expected preparation: Ling 392 and Ling 391.
Also offered for graduate-level credit as Ling 520 and may be taken only oncefor credit. . Prerequisite: Ling 390 or Span 494.

## Ling 431 - Language, Identity, and Culture (4)

Provides a systematic overview of theories and practices concerning the relationship of language, culture, and
identity (personal and cultural). It will addres sommon misconceptions about language and culture, and promote an understanding of the affective nature of language. Students will develop skills in analyzing information and data about culture and language, including variation in language use and thematic analysis of interview data. This course will focus on adult educational settings, domestic and global.
Also offered for graduate-level credit as Ling 531 and may be taken only once for credit. Prerequis ite: Sophomorestanding.

## Ling 432 -S ociolinguistics (4)

Examines the role of language in society and how social factors can influence language. The social is sues around language including language policy and language ideology. Expected preparation: Ling 391.
Also offered for graduate-level credit as Ling 532 and may be taken only once for credit. . Prerequisite: Ling 390 or Span 494.

## Ling 433 - Psycholinguistics (4)

A survey of psycholinguistics and the psychology of language, focusing on the general question of the relation between human language and human beings. Expected preparation: Ling 391.
Also offered for graduate-level credit as Ling 533 and may be taken only once for credit. . Prerequisite: Ling 390 or (Psy 200 and Psy 204) or Span 494.

## Ling 435 - Theories and Practice in Applied Linguistics (4)

An examination of current areas of applied linguistics research focusing on original research and building upon concepts presented in Ling 390 and Ling 391.

Also offered for graduate-level credit as Ling 535 and may be taken only oncefor credit. . Prerequisite: (Ling 390 or Span 494) and Ling 391.

## Ling 437 - First Language Acquisition (4)

Introduction to main aspects of first language acquisition in childhood, frominfancy to theearly school years. Examines comprehension and production of the structural and social as pects of language. Includes discussion of language acquisition theories fromlinguistic, psycholinguistic and sociolinguistic perspectives. Research project based on collection and analy sis of child language data required. Expected preparation: Ling 391.
Also offered for graduate-level credit as Ling 537 and may be taken only once for credit. . Prerequisite: Ling 390 or Span 494.

## Ling 438 - Second Language Acquisition (4)

Introduction to main as pects of second language acquisition fromsociolinguistic and psycholinguistic perspectives. Examines comprehension and production, stages in acquisition, cognitive processes, linguistic environment, individual variables, relationship between first and second language. Research project based on collection and analysis of language-learner language.
Also offered for graduate-level credit as Ling 538 and may be taken only onceforcredit. .Prerequisite:Sophomorestanding.

## Ling 439 - Language Assessment (4)

Theoretical background and practical considerations in the conduct of language as sessment. Students will explore traditional, quantitative methods as well as alternative, qualitative methods for systematically gathering information to informdecisions about individual language ability.

Also offered for graduate-level credit as Ling 539 and may be taken only once forcredit. . Prerequisite: Ling 390; Ling 477.

## Ling 445 - Linguistics and Cognitive Science (4)

Presents current developments in linguistic theory, and in psychological theories of perception, cognition, and information processing (with special focus on language processing). Examines the fusion of linguistic and psychological theories into therapidly growing field of cognitive science. Expected preparation: Ling 391.

Also offered for graduate-level credit as Ling 545 and may be taken only once forcredit. . Prerequisite: Ling 390 or Span 494.

## Ling 470 - Grammar for TESOL (4)

A study of how to teach difficult grammatical structures in English, how to resolve problems and questions that frequently arise in the ESL clas sroom, and how to adapt and supplement ESL grammar tests.
Also offered for graduate-level credit as Ling 570 and may be taken only once for credit. . Prerequisite: Ling 392 or Ling 492 or departmental grammartest.

Ling 471 - Understanding the International Experience (4)

Examination of communication-based dimensions of an international or intercultural experience, including teaching English to speakers of other languages. Development of strategies and activities required to meet the challenges of teaching, working, or doing research in an international/intercultural setting. All linguistics students must register for Ling 471/571, however, this is the same course as Intl471. May be taken concurrently with Ling 390.

Also offered for graduate-level credit as Ling 571 and this course may be taken only once for credit. . Prerequisite: upper-division or postbac academic standing. Cross-Listed as:Intl471.

## Ling 472 - Teaching Pronunciation (4)

This is a practical, hands-on course in which students apply phonetics and phonology in the context of language education. While the focus is on teaching English pronunciation, the course includes general theory and applications that are usefulfor students planning to teach pronunciation of other languages (e.g., Spanish, Chinese).

Also offered for graduate-level credit as Ling 572 and may be taken only once for credit. . Prerequisite: Ling 390 or Span 494.

## Ling 473 - Computer Assisted Language Learning (4)

Introduction to the use of computers in language learning. Examines the research of the field to informpractical considerations for task design and evaluation.

Also offered for graduate-levelcredit as Ling 573 and may be taken only once for credit. . Prerequisite: Ling 477.

## Ling 475 - CurriculumDesign and Materials Development in TESOL (4)

Principles of curriculumdesign and instructional materials development in teaching English to speakers of other languages. Students work in teams to assess needs, design syllabus, develop les sons and materials, plan evaluation for English language program. Covers structural, notional and communicative, task-based, and content based syllabus. Expected preparation: Ling 478 or teaching experience.
Also offered for graduate-level credit as Ling 575 and may be taken only once for credit. . Prerequisite: Ling 390; Ling 477 or instructor's approval.

## Ling 476 - Corpus Linguistics (4)

Introduction to the methods of corpus linguistics, a type of computer-assisted linguistic analysis, as used in applied linguistics and TESOL. Includes weekly computer lab ses sions conducting corpus linguistics work. Expected preparation is Ling 392.
Also offered for graduate-level credit as Ling 576 and may be taken only once for credit. . Prerequisite: Upper division standing.

## Ling 477 - TESOL Methods I (4)

The first in a two-course sequence on classroomteaching focused on theoretical and practical pers pectives on clas sroomteaching and learning. Ling 477 and Ling 478 must be taken in sequence.
Also offered for graduate-level credit as Ling 577 and may be taken only oncefor credit. . Prerequisite: Sophomorestanding.

## Ling 478 - TESOL Methods II (4)

The second in a two-course sequence on classroom teaching. TESOL Methods II uses classroomobservation and practice teaching as a basis to study theoretical and practical pers pectives on classroomteaching and learning. Significant out-of-class time for group work, class room observation and practice teaching is required. After Completing TESOL Methods II, students will have completed many of the hours and assignments needed for their portfolio.
Also offered for graduate-level credit as Ling 578 and may be taken only once forcredit. Prerequisite: Ling 477/Ling 577.

## Ling 480 - Bilingualism (4)

Survey of is sues in volved with bilingualis mthroughout the world. Explores the linguistic, sociolinguistic, and psycholinguistic aspects of simultaneous and subsequent acquisition of one or more languages. Includes perspectives of individual and societal bilingualism, and examines issues involved with bilingual language use, language processing, education, language planning, and language and identity. Expected preparation: Ling 391.
Also offered for graduate-level credit as Ling 580 and may be taken only once for credit. . Prerequisite: Ling 390 or Span 494.

## Ling 481 - World Englishes (4)

Explores the role of English as a world language. Using film, audio tapes, and English language newspapers from around the world, students will become familiar with such Englishes as Malaysian English, Indian English, Nigerian English, and Filipino English. Expected preparation:Ling 391.

Also offered for graduate-level credit as Ling 581 and may be taken only once forcredit. . Prerequisite: Ling 232 or Ling 390 or Span 494.

## Ling 482 - Pidgins and Creoles (4)

Introduces students to the language varieties arising in contactsituations. Concentration on African and New World creoles (and A frican American Vernacular English). Considers the formation of pidgins and creoles in terms of both first and second language acquisition. Looks at the social factors involved in their creation. Expected preparation: Ling 391, Ling 392.
Also offered for graduate-level credit as Ling 582 and may be taken only once for credit. .Prerequisite: Ling 390 or Span 494.

## Ling 490 - History of the English Language (4)

A survey in which the developmentof English phonology, morphology, vocabulary, and syntax is studied through the application of modern linguistic criteria and methodology.

Also offered for graduate-level credit as Ling 590 and may be taken only once for credit. . Prerequisite: Ling 390 or Span 494.

## Ling 501 - Research (1-9)

See department for course description. (Credit to be arranged.)

## Ling 502 - Independent Study (1-9)

(Credit to be arranged.)

## Ling 503 - Thesis (1-9)

See department for course description. (Credit to be arranged.)

## Ling 504 - Cooperative Education/Internship (1-9)

See department for course description. (Credit to be arranged.)

## Ling 505 - Reading and Conference (1-6)

See department for course description. (Credit to be arranged.)

## Ling 506 -Special Projects (1-9)

See department for course description. (Credit to be arranged.)

## Ling 507 -Seminar (1-6)

See department for course description. (Credit to be arranged.)

## Ling 508 - Workshop(1-6)

See department for course description. (Credit to be arranged.)

## Ling 509 - Practicum(1-9)

See department for course description. (Credit to be arranged.)

## Ling 510 -Selected Topics (1-6)

See department for course description. (Credit to be arranged.)

## Ling 511 -Syntax (4)

Introduction to modern grammatical theory, its methods, and findings. Presents patterns of argumentation, models, and basic results of research.

Also offered for undergraduate-level credit as Ling 411 and may be taken only once for credit. . Prerequisite: Ling 521 or (Ling 390 and Ling 392).

## Ling 512 - Phonology (4)

How sounds pattern and how they are used in the world's languages, how those patterns should berepresented, and what theories have been advanced to explain those patterns. Some historical backg round to the subdiscipline and some training in linguistic analysis and argumentation.

Also offered for undergraduate-level credit as Ling 412 and may be taken only once forcredit. Prerequisite: Ling 513 or (Ling 390 and Ling 415).

## Ling 513 - Applied Phonetics and Phonology (4)

Introduces students to the applications of phonetics and phonology to the teaching of English and other real-world problems. Students will learn how to describe the sound system of English, represent its phonology with basic formalisms, and compare this system to that of other languages. This knowledge will enable students to diagnose and remediate problems learners might have with the sound systemof English.

## Ling 514 - Linguistic Pragmatics (4)

A study of current theories of language use, particularly contextual and functional aspects of communication.

Also offered for undergraduate-levelcredit as Ling 414 and may be taken only once for credit. . Prerequisite: Ling 521 or Ling 390.

## Ling 515 - Linguistic Phonetics (4)

Introduces the sounds of the world's languages with a concentration on English. Practical exercises designed to develop skills in production, discrimination, and phonetic transcription. Applications to speech technology and speech pathology.

Also offered for undergraduate-levelcredit as Ling 415 and may be taken only once for credit. . Prerequisite: Ling 513 or Ling 390.

## Ling 516 - Discourse Analysis (4)

The examination of forms and functions in discourse. Using several analytic procedures for understanding how conversation works, especially as applied to language learning and teaching.

Also offered for undergraduate-level credit as Ling 416 and may be taken only once for credit. . Prerequisite: Ling 521 or Ling 390.

## Ling 517 - Endangered Languages (4)

How and why languages are endangered in the Pacific Northwestand elsewhere in the world. Environmental factors, globalization, and colonization will be evaluated for the roles they have played. Consideration is also given to how dying languages can be maintained or "awakened" (revitalized).

Also offered for undergraduate-level credit as Ling 417 and may be taken only once forcredit.

## Ling 518 -Linguistic Morphology (4)

The study of words and word structure. Focuses on analyzing word formation across languages. Examines the relationship between morphology, syntaxand phonology, the theoretical as sumptions that underlie morphological analys is, and some applications of morphological analysis.

Also offered for undergraduate-level credit as Ling 418 and may be taken only once for credit. . Prerequisite: (Ling 513 and Ling 521) or Ling 390.

## Ling 519 - Language Typology (4)

Studies and classifies languages according to their structural features. Introduces (structural) linguistics and studies structures across languages. Prepares students for more theoretical and analytical courses in the department.
Also offered for undergraduate-level credit as Ling 419 and may be taken only once for credit. . Prerequisite: Ling 513 or Ling 521 or Ling 390.

## Ling 520 -Historical and Comparative Linguistics (4)

Study of language relationships and language change. Topics include the genetic classification of languages, language and prehistory, methods of his torical reconstruction, and language contact.
Also offered for undergraduate-level credit as Ling 420 and may be taken only once for credit. . Prerequisite: Ling 390 or Ling 513 or Ling 521.

## Ling 521 - Applied English Grammar (4)

Offers graduate students a foundation in grammar terminology and skills for conducting and writing up analyses of language data to be applied in both research and teaching. The course examines patterns of language use across differentregisters of English and how other languages differ from English in encoding similar information. It also builds awareness of world varieties of English. Students will als o become familiar with commonly used databases for conducting language research.

## Ling 531 - Language, Identity, and Culture (4)

Provides a sy stematic overview of theories and practices concerning the relationship of language, culture, and identity (personal and cultural). It will addres s common mis conceptions about language and culture, and promote an understanding of the affective nature of language. Students will develop skills in analyzing information and data about culture and language, including variation in language use and thematic analysis of interview data. This course will focus on adult educational settings, domestic and global.

Also offered for undergraduate-levelcredit as Ling 431 and may be taken only once for credit.

## Ling 532 - Sociolinguistics (4)

Examines the role of language in society and how social factors can influence language. The social is sues around language including language policy and language ideology. Expected preparation: Ling 521 or Ling 513.
Also offered for undergraduate-level credit as Ling 432 and may be taken only once for credit. .

## Ling 533 - Psycholinguistics (4)

A survey of psycholinguis tics and the psychology of language, focusing on the general question of the relation between human language and human beings.
Also offered for undergraduate-levelcredit as Ling 433 and may be taken only once for credit. . Prerequisite: Ling 390.

Ling 535 - Theories and Practice in Applied Linguistics (4)

An examination of current areas of applied linguistics research focusing on original research and building upon concepts presented in Ling 390 and Ling 391. Expected preparation: Ling 513 or Ling 521 or Ling 531.
Also offered for undergraduate-levelcredit as Ling 435 and may be taken only once for credit. .

## Ling 537 - First Language Acquisition (4)

Introduction to main aspects of first language acquisition in childhood, frominfancy to theearly school years. Examines comprehension and production of the structural and social as pects of language. Includes discussion of language acquisition theories fromlinguistic, psycholinguistic and sociolinguistic perspectives. Research project based on collection and analy sis of child language data required.
Also offered for undergraduate-levelcredit as Ling 437 and may be taken only once for credit. . Prerequisite: Ling 513.

## Ling 538 -Second Language Acquisition (4)

Introduction to main as pects of second language acquisition from sociolinguistic and psycholinguistic perspectives. Examines comprehension and production, stages in acquisition, cognitive processes, linguistic environment, individual variables, relationship between first and second language. Research project based on collection and analysis of language-learner language. Expected preparation: Ling 521 or 517.
Also offered for undergraduate-level credit as Ling 438 and may be taken only once for credit. .

## Ling 539 - Language Ass essment (4)

Theoretical backg round and practical considerations in the conduct of language assessment. Students will explore traditional, quantitative methods as well as alternative, qualitative methods for systematically gathering information to inform decisions about individual language ability.
Also offered for undergraduate-level credit as Ling 439 and may be taken only once forcredit. . Prerequis ite: Ling 577.

## Ling 545 - Linguistics and Cognitive Science (4)

Presents current developments in linguistic theory, and in psychological theories of perception, cognition, and information processing (with special focus on language processing). Examines the fusion of linguistic and psychological theories into therapidly growing field of cognitive science.
Also offered for undergraduate-level credit as Ling 445 and may be taken only once for credit. . Prerequis ite: Ling 521 or Ling 513 or background in Psychology.

## Ling 559 - Introduction to Graduate Study in Applied Linguistics (2)

Serves as an introduction to graduate study in applied linguistics with an emphasis on critical reading, writing, and research skills needed for success in the MA.

## Ling 560 - Research Design for Applied Linguistics (2)

Presents the major designs for research in applied linguistics. Introduces basic quantitative and qualitative methodological concepts. Provides a basis to critically read research literature in TESOL and applied linguistics. Students write a preliminary review of the literature and research question(s) for their M.A. thesis proposal.

Prerequis ite: admis sion to theM.A.TESOL programand at least 16 credits in applied linguistics.

## Ling 561 - Research Methodology for Applied Linguistics (2)

Second course in a two-course sequence required for M.A. TESOL students, focusing on data collection and analysis. Builds upon introduction to methods in Ling 560. Students work with data, using both quantitative and qualitative techniques. Students write a preliminary draft of the methods section for their M.A. thesis proposal.
Prerequisite: Ling 560 (no concurrentenrollment allowed).

## Ling 565 - Research in Language Teaching and Applied Linguistics (4)

Introduces students to the basics of reading and writing about research in TESOL. It will develop the metalanguage neces sary for dis cussing and critically evaluating research articles, skills for synthesizing research articles, and identifying and evaluating research methodologies. Students will also practice skills for proactively searching out information to better understand research so the y can continue to be critical consumers of research as they enter the teaching profession.
Prerequisite: Graduatestanding and 12 credits of Applied Linguistics at the 500-level including Ling 521.

## Ling 566 - Culminating Workshopfor TESOL and Applied Linguistics (4)

Workshop for students in the MA TESOL program. As part of this course, students will develop a portfolio that contains revised work fromprevious courses (both language analysis and pedagogical), prepare a short public presentation, developjob application materials, and synthesize and reflect on what they have learned in the program.
Prerequisite: Graduate-standing and completion of at least 36 credits in the MA TESOL program.

## Ling 570 - Grammar for TESOL (4)

A study of how to teach difficult grammatical structures in English, how to resolve problems and questions that frequently arise in the ESL clas sroom, and how to adapt and supplement ESLgrammar tests.
Also offered for undergraduate-levelcredit as Ling 470 and may be taken only once for credit. . Prerequisite: Ling 392 or Ling 521 or consent of instructor.

## Ling 571 - Understanding the International Experience

 (4)Examination of communication-based dimensions of an international or intercultural experience, including teaching English to speakers of other languages. Development of strategies and activities required to meet the challenges of teaching, working, or doing research in an international/intercultural setting. All linguistics students
must register for Ling 471/Ling 571, however, this is the same course as Intl 471 and BSt 471.

Also offered for undergraduate-level credit as Ling 471 and this course may be taken only once for credit.

## Ling 572 - Teaching Pronunciation (4)

This is a practical, hands-on course in which students apply phonetics and phonology in the context of language education. While the focus is on teaching English pronunciation, the course includes general theory and applications that are usefulfor students planning to teach pronunciation of other languages (e.g., Spanish, Chinese).
Also offered for undergraduate-level credit as Ling 472 and may be taken only once for credit. . Prerequisite: Ling 390 or Ling 513 or consent of instructor.

## Ling 573 - Computer Assisted Language Learning (4)

Introduction to the use of computers in language learning. Examines the research of the field to inform practical considerations for task design and evaluation.

Also offered for undergraduate-level credit as Ling 473 and may be taken only once forcredit. . Prerequisite: Ling 477/577.

## Ling 575 - Curriculum Design and Materials Development in TESOL (4)

Principles of curriculumdesign and instructional materials development in teaching English to speakers of other languages. Students work in teams to assess needs, design syllabus, develop lessons and materials, plan evaluation for English language program. Covers structural, notional and communicative, task-based, and content based syllabus. Recommended:Ling 478 or teaching experience.
Also offered for undergraduate-level credit as Ling 475 and may be taken only once forcredit. . Prerequis ite: Ling 390; Ling 477 or instructor's approval.

## Ling 576 - Corpus Linguistics (4)

Introduction to the methods of corpus linguistics, a type of computer-assisted linguistic analysis, as used in applied linguistics and TESOL. Includes weekly computer lab ses sions conducting corpus linguistics work. Expected preparation is Ling 392 or Ling 521.
Also offered for undergraduate-level credit as Ling 476 and may be taken only once for credit. .

## Ling 577 - TESOL Methods I (4)

The first in a two-course sequence on classroomteaching focused on theoretical and practical pers pectives on clas sroomteaching and learning. Ling 577 and Ling 578 must be taken in sequence.
Also offered for undergraduate-level credit as Ling 477 and may be taken only once for credit. .

## Ling 578 - TESOL Methods II (4)

The second in a two-course sequence on classroom teaching. TESOL Methods II uses classroomobservation and practice teaching as a basis to study theoretical and practical perspectives on classroomteaching and learning. Signific ant out-of-class time for group work, class room observation and practiceteaching is required. After Completing TESOL Methods II, students will have completed many of the hours and assignments needed for their portfolio.
Also offered for undergraduate-levelcredit as Ling 478 and may be taken only once for credit. Prerequisite: Ling 477/Ling 577.

## Ling 580 - Bilingualism (4)

Survey of is sues involved with bilingualis mthroughout the world. Explores the linguistic, sociolinguistic, and psycholinguistic aspects of simultaneous and subsequent acquisition of one or more languages. Includes perspectives of individual and societal bilingualism, and examines issues involved with bilingual language use, language processing, education, language planning, and language and identity. Expected preparation is Ling 513 or Ling 521.
Also offered for undergraduate-level credit as Ling 480 and may be taken only once for credit. .

## Ling 581 - World Englishes (4)

Explores the role of English as a world language. Using film, audio tapes, and English language newspapers from around the world, students will become familiar with such Englishes as Malaysian English, Indian English, Nigerian English, and Filipino English.

Also offered for undergraduate-levelcredit as Ling 481 and may be taken only once for credit. . Prerequisite: Ling 232 or Ling 390 or Ling 513 or Ling 521.

## Ling 582 - Pidgins and Creoles (4)

Introduces students to the language varieties arising in contactsituations. Concentration on African and New World creoles (and African American Vernacular English). Considers the formation of pidgins and creoles in terms of both first and second language acquisition. Looks at the social factors involved in their creation.
Also offered for undergraduate-levelcredit as Ling 482 and may be taken only once for credit. . Prerequisite: Ling 390 or Ling 513 or Ling 521.

## Ling 590 - History of the English Language (4)

A survey in which the developmentof English phonology, morphology, vocabulary, and syntax is studied through the application of modern linguistic criteria and methodology. Expected preparation is Ling 521 or Ling 392.

Also offered for undergraduate-level credit as Ling 490 and may be taken only once for credit. . Prerequisite: Ling 513 or Ling 390.

## ME - Mechanical Engineering <br> ME 120 - An Introduction to Engineering (3)

An introduction to the skills, modern tools, teamwork, design methodology and professional practices of mechanical engineers. Students learn to analyze, fabricate and troubleshoot electromechanical systems. Students are introduced to computer programming and solid modeling. Written and oral communication is required complete as signments and clas s projects.

Prerequisite: Mth 251 (concurrent enrollment allowed) or Mth 252.

## ME 121 - Introduction to Systems and Control (3)

An introduction to sensors and control of electromechanical systems. Students assemble an electromechanical systemand programa microcontroller to sense the sy stems tate and maintain systemequilibrium. Students build on the skills developed in ME 120. Written and oral communication is required to complete as signments and clas s projects.
Prerequisite: ME 120 with a grade of C or better.

## ME 122 - Introduction to Design (3)

An introduction to statics, dynamics, mechanical systems and the design process. Students learn to incorporate economic, social and environmental factors in the design of mechanical devices. Written and oral communication is required to complete assignments and a major class project.
Prerequisite: ME121 with a grade of C or better.

## ME 199 -Special Studies (1-3)

(Credit to be arranged.) Consent of instructor.

## ME 213 - Properties of Materials (4)

Basic properties, behavior, and survey of engineering and industrial applications of metals, polymers, ceramics, and composites.
Prerequisite: Ch 221. Lecture and laboratory. Corequisite: ME 213L.

## ME 213L - Properties of Materials Lab (0)

Lab for Properties of Materials.
Corequisite: ME213.

## ME 240 -Survey of Manufacturing Processes (2)

Survey of manufacturing processes, including casting, forming, machining, joining, and nontraditional processes. Emphas is on process capabilities and limitations and design for manufacturability. Also includes topics in product design, material selection, and process planning.
Prerequisite: ME213. Corequisite: ME240L.

## ME 240L-Survey of Manufacturing Processes Lab (0)

Lab for ME 240.
Corequisite: ME240.

## ME 250 -Geometric Modeling (2)

Geometric modeling of parts and as semblies using a commercial solid modeling system. Topics include principles of parametric geometry construction and modeling fordesign intent. Course covers part/assembly constructions for machine design including creation of drawings and dimensioning techniques. Other topics include sheetmetal parts modeling, standard library parts, and presentation methods.

## ME 299 -Special Studies (1-4)

(Credit to be arranged.)

## ME 304U - Energy and Society (4)

Study of the energy problem: a complex societal problem which has a major technical component. Designed to help nonscience majors understand the technicalside of the energy problemas well as the multidisciplinary effects of technical decisions on the social, political, and economic framework. Examination of energy requirements and usage, energy resources, methods for producing energy, environmental and economic implications of energy production, energy conservation, and energy policies. Power production techniques utilizing coal, nuclear, solar, wind, geothermal, and other energy sources will be studied.
Prerequisite: upper-division standing.

## ME 313 - Analysis of Mechanical Components (4)

Stress and deflection analysis of structural components including review of stress and strain; curved beams; pressure vessels, impact loading, stability, and energy methods. Failure theory of mechanical components under static and fatigue loads will also be dis cussed.

Prerequisite: ME213 (concurrent enrollment allowed), EAS 212, Mth 261.

## ME 314 - Analysis and Design of Machine Eements (4)

Analysis and design of machine elements and systems, covering failure theories, fatigue, fas teners, welds, gears, springs, bearings, introduction to stochastic design. Topics will be synthesized in a design project.
Prerequisite: ME313.

## ME 320 - Fluid Mechanics (4)

Properties of fluids; hydrostatics; fluid dynamics, Bernoulli?s Equation; conservation of mass, energy, and momentum; differential analy sis; and dimensional analys is. Lecture and laboratory. Co-requisite: ME320L.
Prerequisite: EAS 215, Mth 256. Corequisite:ME320L.
ME 320L - Fluid Mechanics Lab (0)
Lab for ME 320 Fluid Mechanics.
Corequisite: ME320.

## ME 321 - Engineering Thermodynamics I (4)

Study of energy sources and utilization; First and Second Laws of thermodynamics; closed and control volume systems: thermodynamic processes and cycles; thermodynamic properties; heat power systems.
Prerequisite: Ph 213, Mth 252.

## ME 322 - Applied Fluid Mechanics and Thermodynamics (4)

Internal flow, external flow, and compressible flow. Lift and drag. Turbomachinery, combustion, and psychometry.
Prerequisite: ME320, ME 321.

## ME 323 -Heat Transfer (4)

Fundamentals of engineering heat transfer with design applications; steady-state and transient analysis of conduction in one and two dimensions; concepts of convection, forced convection, internal and external flows, natural convection, and heat exchanger design; study of radiation concepts and radiation exchange between surfaces.
Prerequisite: Mth256, Mth 261, ME 320, ME 321.
ME 350 - Programming and Numerical Methods (2)
Introduction to programming. Topics include: MATLAB programming; variables, arrays, logical expres sions, and loops; structured programming with m-files, input and output control; introduction to engineering applications of numerical computing.
Prerequisite: EAS 101 or ME 121, Mth 261.
ME 351 - Vibrations and SystemDynamics (4)
An introduction to vibrations and systemdy namics for single and multiple degree-of-freedomlinear systems. The
course includes: free and forced vibrations; resonance; modeling of mechanical and electrical systems; Laplace transformations; and dynamic systemresponse in the time and frequency domains. Computer analysis and solution techniques will be utilized.

Prerequisite: EAS 215, Mth 256, Mth 261, ECE 241, ME 350.

## ME 370 -Mechanical Engineering Profession (2)

Presentation of a variety of specialties and career options for the graduates of the BSMEprogram. Includes exposure to topics related to effective and responsible practice of mechanicalengineering. Topics include: engineering ethics, intellectual property, business norms and practices, life-long learning, the relationship of engineering to society, and an awareness of contemporary local and global is sues. Expected preparation: junior standing.

## ME 399 -Special Studies (1-8)

(Credit to be arranged.)

## ME 401 - Research (1-6)

(Credit to be arranged.) Consent of instructor.

## ME 402 - Independent Study (1-12)

(Credit to be arranged.)

## ME 403 -Honors Thesis (1-4)

(Credit to be arranged.) Consent of instructor.

## ME 404 -Cooperative Education/Internship (1-12)

(Credit to be arranged.) Consent of instructor.

## ME 405 - Reading and Conference (1-6)

(Credit to be arranged.) Consent of instructor.

## ME 406-Special Projects (1-6)

(Credit to be arranged.) Consent of instructor.

## ME 407 -Seminar (1-6)

(Credit to be arranged.) Consent of instructor.

## ME 410 -Selected Topics (1-6)

(Credit to be arranged.) Consent of instructor.

## ME 410L - Special Topics Lab (0)

Special topics lab. Pleasecontact department for more informaiton.

## ME 411 - Engineering Measurement and Instrumentation Systems (4)

Principles and applications of measurement methods and instrumentation techniques, as used in various engineering disciplines, are studied. Examination of general measurement concepts and instrumentation characteristics. Specific devices formeasuring such parameters as displacement, force, strain, pressure, flow, temperature, motion, time, and frequency are discussed. Testing and verification of theory, design, and laboratory evaluation of mechanical components and systems are also made. Lecture and laboratory.

Also offered for graduate-levelcredit as ME511 and may be taken only once for credit. . Prerequisite: ECE 221, senior standing in eng ineering. Corequisite: ME411L.

## ME 411L - Engineering Measurement and Instrumentation Systems Lab(0)

Lab for ME 411 Engineering Measurement and Instrumentation Systems.
Corequisite: ME411.

## ME 413 - Engineering Material Science (4)

Study of materials with emphasis on solids; effect of microstructure and macrostructure on properties; equilibriumand non-equilibriummultiphase systems; effects of mechanical and thermal stresses, electromagnetic fields, irradiation, and chemical environments, surface and related phenomena; examples frommetallic, ceramic, polymeric, and composite materials.
Also offered for graduate-level credit as ME513 and may be taken only once for credit. . Prerequisite: ME213.

## ME 415 - Advanced Topics in Energy Conversion (4)

Topics chosen for relevancy to current technological practice concerned with energy convers ion. Examples include cogeneration, combined cycles, gas power plants in the Northwest, wood waste utilization, advanced engine design and combustion systems, and energy conversion systems pollution control. Each offering of this course will focus on a different single selected topic.
Also offered for graduate-level credit as ME515.

## ME 420 - Thermal Systems Design (4)

Introduction to the design of thermal systems for HVAC, energy conversion, and industrial process applications. Procedures for selection of fluid flow equipment, heat exchangers, and combustion equipment. Modeling performance of components and systems. Costestimation and economic evaluation. Design optimization.

Also offered for graduate-level credit as ME520 and may be taken only once forcredit. .Prerequisite: ME320, ME 323.

## ME 421 -Heating, Ventilating, and Air Conditioning Design Fundamentals (4)

Fundamental principles and methods of controlling living space environments; design of heating, ventilating, air conditioning, and refrigeration systems for residential, commercial, and industrial purposes. Topics include: moist air properties (psychometrics), air conditioning processes, indoor air quality (comfort and health), heat transmission in building structures, solar radiation, space heating and cooling load analysis, energy calculations, and air conditioning systems and equipment.
Also offered for graduate-level credit as ME521 and may be taken only onceforcredit. . Prerequisite: ME323.

## ME 422 -Building Energy Use Modeling (4)

Analysis of annual energy use of residential and commercial buildings. Emphasis on computer simulation techniques for analysis of building energy use and study of energy-efficient building design. Topics include: heat loss and gain in buildings, heating and cooling load calculations, energy use analysis, daylighting in commercial buildings, energy efficiency, green building technologies, and modeling for energy codecompliance. Project in design/simulation.
Also offered for graduate-level credit as ME522 and may be taken only onceforcredit.

## ME 423 -Fundamentals of Building Science (4)

Introduction to the fundamental concepts of building science. Buildings as a system, including interactions among subsystems such as heating and cooling, ventilation, the thermal envelope, air leakage, and occupants. Building energy efficiency. Performance of heating, cooling, and ventilating systems. Indoor air quality and other health and safety is sues, including assessing and resolving mois ture problems. Applications of common and cutting-ed ge building science meas urement and monitoring tools. The class will include one lecture and one lab session each week. Some/all of the lecture portion of the course may be delivered online through course-management software. Group projects may involve laboratory meas urement, field monitoring, and/or computer simulation.

Also offered for graduate-level credit as ME523 and may be taken only once for credit. . Prerequisite: ME321 or graduate standing in engineering or architecture.

## ME 424 - HVAC SystemDesign and Controls (4)

Design of HVAC equipment, integration of systems, and design of controls for buildings. Application of HVAC fundamentals. Subjects include: building, block and zone load estimates; air/hydronic systems design; refrigeration; air handling units; cooling andheating plants; basic control concepts; sensors and actuators; pneumatic, electronic, and digital controls; HVAC subsystemand controls; complete HVAC systems and controls.
Also offered for graduate-levelcredit as ME524 and may be taken only once for credit. . Prerequisite: ME421/521 and ME351.

## ME 425 - Advanced Topics in Building Science (4)

Indoorenvironmental quality and sustainable built environments. Material balance principles applied to fate and transport of pollutants in urban and indoor environments; approaches for quantify ing and characterizing sources, transport, transformation, and control of indoor air pollutants; energy conservation and indoor air pollution; quantifying human exposures to air pollutants. Course includes assembly of building science sensors on Arduino platform, calibration, and collection and analysis of primary data. Familiarity with differential equations and intro-level chemistry andfluid mechanics is recommended.

Also offered for graduate-level credit as ME525 and may be taken only oncefor credit.

## ME 426 - Solar Engineering (4)

Overview of solar energy and its applications. Solar resources, solareconomics, collector technology, solar thermal systems, power generation, industrial applications, thermal storage, photovoltaics, and design of systems for effective utilization of solar energy.

Also offered for graduate-level credit as ME526 and may be taken only once for credit. . Prerequisite: ME323.

## ME 427 - Phase Transformations and Kinetics in Materials (4)

Designed to facilitate understanding of the thermodynamic forces driving material phase transformations and the role that strain energy and interfacial energy play in producing or modifying these forces. Also explores microstructure, a fundamental topic of study for students in material and mechanical engineering fields.
Also offered for graduate-level credit as ME527 and may be taken only once for credit. Prerequisite: Senior or graduate standing in Engineering.

## ME 428 -Scanning Electron Microscopy for Materials and Device Characterization (4)

The study of the design concepts and applications of scanning electron microscopy (SEM) and spectroscopy. Topics include electron optical principles, specimen preparation, and SEM imaging and interpretation. The spectroscopy of microanalysis covers qualitative and quantitative chemical analysis of materials. The lectures and lab ses sions are integrated to enhance students? learning experience.

Also offered for graduate-level credit as ME528 and may be taken only once for credit. Prerequisite: One year of general engineering or physics or ins tructor approval. Corequisite: ME428L.

## ME 428L - Scanning Electron Micros copy for Materials and Device Characterization Lab (0)

Lab for ME 428.
Corequisite: ME428.

## ME 429 - Transmission Electron Microscopy and Chemical Analysis of Materials (4)

Introduction to the theoretical concepts and practical applications of transmission electron microscopy (TEM) and spectroscopy for materials characterization. The chemical analys is techniques include energy dis persive X ray spectroscopy and electron energy loss spectroscopy. The lab provides hands-on experiences for students to operate thestate-of-the-art TEM and the attached analytical accessories.
Also offered for graduate-level credit as ME529 and may be taken only once for credit. Prerequisite: One year of general engineering or physics.

## ME 437-Mechanical Systems Design (4)

Objective of this course is to integrate various analysis methods in the context of design projects with realistic constraints. Emphasis is on defining problems, identifying solution methods, and synthesizing solutions while considering production and economic factors. Teamwork, communication skills, and ability to learn independently is highly emphasized.
Also offered for graduate-level credit as ME537 and may be taken only onceforcredit. .Prerequisite:ME240, ME 351, ME 314.

## ME 438 - Fundamentals of MEMS and Micros ystems (4)

The underlying principles of physics, mechanics and materials science as they apply to MEMS will be covered and coupled closely with the basic and applied aspects of micros ystems engineering. Case studies involving the design, operation, fabrication and packaging of MEMS devices will be presented throughout theclass.

Also offered for graduate-level credit as ME538 and may be taken only once for credit. . Prerequisite: senior or graduate standing.

## ME 443 - Advanced Engineering Thermodynamics (4)

Thermodynamics of physical and chemical systems with engineering applications;: basic thermodynamic relationships; advanced techniques for their use; systems of variable composition; heat effects for reacting systems; equations of state, phase, and chemical equilibria for ideal and nonideal systems. To include oneor more of several special topics: chemical kinetics; reactor analysis fundamentals; second law analysis of thermodynamic systems; introduction to statistical thermodynamics; advance energy conversion systems.

Also offered for graduate-level credit as ME543 and may be taken only once for credit. Prerequis ite: ME321.

## ME 445 - Advanced Topics in Thermal and Fluid Sciences (4)

Course topics are chosen for relevancy to current technological practice concerned with thermal and fluid sciences. Each offering of this course focuses on a specific area and is not a survey. Examples include thermal management of electronic equipment and theoretical fluid mechanics.

Also offered for graduate-level credit as ME545 and may be taken only once for credit.

## ME 446 - Compressible Flow (4)

Introduction to compressible flow (gas dynamics). Is entropic flow in varying area ducts (nozzles, diffusers). Adiabatic flow in constant area ducts with friction. Frictionless flow in constant area ducts with heat transfer. Normal, oblique, and moving shock waves. Detonation and deflagration. Applications.
Prerequisite: ME322, EAS 361.
ME 447 - Transfer and Rate Processes (4)
An advanced treatment of heat, mass, and momentum transfer. Development of the conservation laws, transport laws, transport properties, and basic analytic solutions. Applications to heat transfer equipment, cataly tic reactors, drying processes.

Also offered for graduate-level credit as ME547 and may be taken only once for credit. . Prerequisite: ME323, ME 320 , senior or graduate standing.

## ME 448 - Applied Computational Fluid Dynamics (4)

Computational fluid dynamics (CFD) is presented as a design tool for analyzing flow and heat transfer. Algorithms implemented in commercial CFD packages are reviewed. Training in use of a commercial code is provided. Case studies reinforce fundamental understanding of flow and heat transfer, and highlight the
implementation-specific aspects of commercial codes. An independent project is required.

Also offered for graduate-level credit as ME548 and may be taken only once forcredit. .Prerequisite: Completion of ME 322 and ME 323 with a grade of B or higher.

## ME 449 - Thermal Management Measurement (4)

Provides a survey of laboratory-based techniques used to diagnose electronic cooling problems, and to obtain design data for developing thermal management solutions. Provides significant practical experience: students design and build theirown experiments; they take and analyze their own data. Measurements are made with handheld instruments, bench-top instruments, and with computer controlled data acquisition systems. Data reduction techniques involving centering (removal of bias error) and uncertainty analysis are usedextensively. Lecture and laboratory.
Also offered for graduate-level credit as ME 549 and may be taken only once forcredit. .Prerequisite:ME323,411.

## ME 450 -Solid Modeling (4)

Emphas is is on solid model construction methods using state-of-the-artsolid modeling software. Topics include use of parametric geometry, construction and modification of solids, building and animating assemblies, working in groups, building sheet metal parts, drafting, and the presentation of the fundamentals of solids modeling including representation and manipulation of wireframes, surfaces, and solids. Lecture and laboratory.
Also offered for graduate-level credit as ME550 and may be taken only once for credit. .Prerequisite: senior or graduate standing in engineering or a closely related field.

## ME 452 -Control Engineering I (4)

Introductory controls class offered to upper-division mechanical engineering undergraduates and graduate students. Includes classical theory as applied to linear systems with topics: mathematical modeling of control systems; transfer functions and block diagrams; transient response; stability; root-locus method; frequency res ponse method; and control systemdesigntechniques. Computer analys is and solution techniques will be utilized.
Also offered for graduate-level credit as ME552 and may be taken only once forcredit. .Prerequisite: upper-division ME undergraduate or graduate student; Mth 256; ECE 221; ME 351.

## ME 453 -Control Engineering II (4)

Continuous control system design and applications using transfer function and state variable approaches. Introduction to digital control system design, including: transfer function and state space formulation, and time and frequency domain analy sis techniques. Computer analys sis and solution techniques will be utilized.

Also offered for graduate-level credit as ME553 and may be taken only oncefor credit. . Prerequisite: ME452/552.

## ME 454 - Controls Engineering Laboratory (4)

Design, construction and implementation of continuous controllers using analog devices. Experimental identification of the dynamic properties of mechanical systems. Digital controllers introduced, implemented and compared with the corresponding continuous controllers. Expected preparation: ME453/553.

Also offered for graduate-level credit as ME554 and may be taken only once for credit. . Prerequisite: ME452/552.

## ME 455 - Finite Element Modeling and Analysis (4)

The finite element method as related to the solution of mechanical design problems including thermal stress analys is. Various element formulations will be discussed, and existing commercial codes will be used to demonstrate modeling and analysis techniques.
Also offered for graduate-level credit as ME555 and may be taken only once for credit. .Prerequisite: for ME455: ME 314; for ME 555: graduate standing in engineering.

## ME 456-Mechatronics (4)

Students will gain an understanding of mechatronic (mechanical-electrical) systems and apply this knowledge directly in hands-on lab experiments. They will build circuits, collect sensor data, usea microcontroller, and control a motor. The format of the course will be one lecture and one lab per week.

Also offered for graduate-level credit as ME556 and may be taken only once for credit. Prerequisite: ME351.

## ME 457 - Introduction to Robotics (4)

Robot kinematics dynamics and control; basic components of robots: controllers, power supplies and endeffectors; industrial applications of robots using peripheral devices, sensors, and vision.
Also offered for graduate-level credit as ME557 and may be taken only once for credit. . Prerequisite:ME351.

## ME 458 - Principles Of CNCMachining (4)

A study of principles of machining, tool path generation and analytic geometry, part design and programming, integration of CAD/CAM software, structure and control of CNC machines, and introduction to computer-integrated- manufacturing. Lecture and laboratory.
Also offered for graduate-level credit as ME558 and may be taken only once for credit. .Prerequisite: ME241 and senior standing in mech anicalengineering.

## ME 460 - Control of Mechanical Systems using Microcontrollers Laboratory (4)

Basic interfacing and programming of microcontrollers for controls applications is introduced. Microcontrollers are interfaced with various external devices and sensors using A/D, D/A and the SPIbus. Control of a motordriven mechanical device is implemented. A studentselected final project involving the control of a physical systemis required.
Also offered for graduate-level credit as ME560 and may be taken only once forcredit. .Prerequisite:ME453/553 and ME454/554 (concurrent enrollment with ME460/560 allowed).

## ME 461 -Buildings and health: Indoor air quality (4)

We spend $90 \%$ of our time inside buildings and much of our exposure to air pollution occurs indoors. Students develop mass-balance models of pollutant fate, transport, and transformation for indoor spaces including parameterizing indoor sources (emissions), indoor-outdoor transport (ventilation), transformation (removaland chemical reactions), and control strategies for indoor air pollutants. Students solve developed models with analytical and numerical methods. Students use massbalance models to inform as sessment of human exposure to air pollution and infectious disease transmission.
Also offered for graduate-level credit as ME561 and may be taken only once for credit. Prerequisite: ME320 or equivalent.

## ME 463 - Advanced Topics in Control Engineering (4)

Mathematical foundations and applications of various advanced topics in control engineering for both continuous- and discrete-time systems.

Also offered for graduate-level credit as ME563 and may be taken only once for credit. .Prerequis ite:ME453/553.

## ME 465 - Advanced Finite Element Applications (4)

This course builds on the knowledge of introductory finite element modeling and analysis course to provide students with advanced working knowledge to tackle real world problems. Advanced elementtypes such as Plate and Shell as well as Gap and Contact will be discussed. Advanced modeling and analysis topics include nonlinearity in stress analysis(including geometric and material nonlinearity), Buckling, Gap/Contact analysis, forced vibration and frequency res ponse, advanced thermal/structural interactions, and mixed element modeling.
Also offered for graduate-level credit as ME565 and may be taken only once for credit. .Prerequisite:ME455 or equivalent.

## ME 471 -Process Measurement and Control (4)

Introduction to process control hardware, software, and interfacing. Lecture topics include: number systems, hardware concepts, data movement, programming, and interfacing. Lab exercises involve the use of microcomputers interfaced and programmed for various control and data acquisition applications. Lecture and laboratory.
Also offered for graduate-level credit as ME571 and may be taken only once for credit. . Prerequisite: ME411/511; ECE 201, ECE 221.

## ME 474 - Rapid Prototyping, 3D Printing, and Additive Manufacturing (4)

Focus on rapid prototyping during an engineering design cycle to provide a comprehensive understanding of the methods, physical processes, resulting part attributes, and applications for the most common 3D printing technologies used by engineers. Both direct and indirect manufacturing processes are covered as well as some exposure to rapid manufacturing. Othertopics include processing, part quality and metrology, 3D scanning, mesh manipulation and repair, and mechatronics review.
Also offered for graduate-level credit as 574 and may be taken only once for credit. Prerequisite: Upper-divis ion standing.

## ME 475 - Joining Processes and Design (4)

Course covers manual and robotic welding, brazing, and soldering processes as well as rapid and economical cutting methods. Welding design with steel, stainless steel, and aluminumto provide economy, strength, and crack resistance is emphasized. Heat flow calculations in welding; preheat and crack-preventing calculations are used. Welding codes are covered.
Prerequisite:ME240.

## ME 476 - Materials Failure Analysis (4)

Fundamental mechanis ms related to failure of metal and alloys used in engineering structures. Mechanisms include: ductile and brittle fracture, fatigue, corrosion fatigue, wear, liquid erosion, stress corrosion, hydrogen-assisted cracking, elevated temperature failures, and many others. Analytical tools used to identify types of failures including: optical metalography, scanning electron microscopy, secondary ion mass spectroscopy, electron probe microanalysis, X-ray photoelectron spectroscopy, Auger electron spectroscopy, andothers. Ductile, brittle, intergranular, cleavage, quasi-cleavage, and microvoid coalescence modes of fracture are discussed. Failures in weldments, brazed and soldered joints, castings, bearings, boilers, forgings, pipelines, bridge components, gears, springs, wear components, tools, and dies.

Also offered for graduate-level credit as ME576 and may be taken only once for credit. Prerequisite: ME314.

## ME 477 - Introduction to Semiconductor Manufacturing (4)

Introduction to semiconductor manufacturing technologies and its engineering field. Technologies studied include silicon wafer manufacturing, thermal processes, photolithography, ion implantation, etch, dielectric thin films, metallization, chemical mechanical polishing, as sembly, sorting, and testing. Topics cover industry overview, technology trends and common engineering practices. The topics chosen are aligned with real fabrication facilities and are suitable forengineering and science students who want to be process, manufacturing, or equipment engineers in the semiconductor industry.

Also offered for graduate-level credit as ME577 and may be taken only once forcredit. Prerequisite: Senior or graduate standing in engineering.
ME 478 - Introduction to Electronic Packaging (4)
This course provides a foundation on mechanical and materials as pects of electronic packaging as well as an understanding of the fundamental mechanical principles used in the design of electronic packages, boards, subsystems, and systems with focus on their integration. Topics include design, properties, materials, interconnections, assembly processes, performance of various packaging s ystems, thermal management, failure mechanisms and reliability.

Also offered for graduate-level credit as ME578 and may be taken only once for credit. . Prerequisite: ME313 or equivalent.

## ME 481 -Mechanical Tolerancing (4)

Presents the principles of dimensioning and tolerancing standards including syntax, meaning, verification methods, and relation to design requirements. Topics include statistical techniques for tolerance analysis, standards of surface roughness, limits and fits, and hardware and software products. A termproject on a mechanical part product intended for manufacturing is required.

Also offered for graduate-level credit as ME581 and may be taken only once forcredit. .Prerequisite: ME240, ME 491 concurrently.

## ME 488 -Design of Experiments (4)

Presents the methods of planning the datacollection scheme in industrial experimentation. Topics to be covered are methods of statistical inference, randomization, blocking, empirical and mechanistic model building using factorial, fractional factorial designs, and least squares methods.

Prerequisite: Seniorstanding in mechanical engineering.

## ME 491 - Design Process (2)

Design methodologies will be discussed as a framework for solving broadly defined technology problems. Interdisciplinary organizational principles will be presented as tools in the design process and as a foundation for the subsequent project course. Lectures, weekly and term case studies.

Prerequisite: ME240, ME 314, ME 322, ME 351, Wr327.

## ME 492-Conceptual Design Project (4)

Application of design methodology to original projects performed by groups of 3 to 5 students under faculty and industrial adviser. Design process willencompass engineering analysis and broader factors such as group organization, interdisciplinary interaction, and communication. The problemdefinition to alternative selection phases will be emphasized. Lectures, group, and class presentations.
Prerequisite: ME491.

## ME 493 - Detailed Design Project (4)

Application of design methodology to original projects begun in ME492. The alternative selection to implementation phases will be emphasized. Lectures, group and clas s presentations.

Prerequisite: ME492.

## ME 501 - Research (1-9)

(Credit to be arranged.) Consent of instructor.

## ME 502 - Independent Study (1-9)

(Credit to be arranged.)

## ME 503 - Thesis (1-9)

(Credit to be arranged.) Consent of instructor.

## ME 504 - Cooperative Education/Internship (1-9)

(Credit to be arranged.) Consent of instructor.

## ME 505 - Reading and Conference (1-6)

(Credit to be arranged.) Consent of instructor.

## ME 506-Special Projects (1-9)

(Credit to be arranged.) Consent of instructor.

## ME 507 -Seminar (1-6)

(Credit to be arranged.) Consent of instructor.

## ME 510 -SelectedTopics (1-6)

(Credit to be arranged.) Consent of instructor.

## ME 510L - Special Topics Lab (0)

Special topics lab. Pleasecontact department for more information.

Corequisite: ME510.

## ME 511 -Engineering Meas urement and Instrumentation Systems (4)

Principles and applications of measurement methods and instrumentation techniques, as used in various engineering disciplines, are studied. Examination of general measurement concepts and instrumentation characteristics. Specific devices for measuring such parameters as displacement, force, strain, pressure, flow, temperature, motion, time, and frequency are discussed. Testing and verification of theory, design, and laboratory evaluation of mechanical components and systems are also made. Lecture and laboratory.

Also offered for undergraduate-levelcredit as ME411 and may be taken only once for credit. . Prerequis ite: senior standing in engineering. Corequisite: ME511L.

## ME 511L - Engineering Measurement and Instrumentation Systems Lab (0)

Lab for Engineering Measurement and Instrumentation Systems.
Corequisite: ME511.
ME 512 - Advanced Vibrations (4)
Vibration analysis of single and multiple degree of freedomsystems. Topics include: (1) modeling of linear systems using matrix methods; (2) modal analys is; (3) general forcing and Fourier series methods; (4) random and self excited vibrations; (5) nonlinear vibrations.

Also offered as ME612 and may be taken only once for credit. .

## ME 513 - Engineering Material Science (4)

Study of materials with emphasis on solids; effect of microstructure and macrostructure on properties; equilibriumand non-equilibriummultiphase systems; effects of mechanical and thermal stresses, electromagnetic fields, irradiation, and chemical environments, surface and related phenomena; examples frommetallic, ceramic, polymeric, and composite materials.

Also offered for undergraduate-level credit as ME413 and may be taken only once for credit. .

## ME 515 - Advanced Topics in Energy Conversion (4)

Topics chosen for relevancy to current technological practice concerned with energy convers ion. Examples include cogeneration, combined cycles, gas power plants in the Northwest, wood wasteutilization, advanced engine design and combustion systems, and energy conversion systems pollution control. Each offering of this course will focus on a different single selected topic.

Also offered for undergraduate-level credit as ME415.

## ME 519 - Development Engineering (4)

Reviews some of the origins of poverty and the current conditions of people in developing countries, and offers some engineering driven solutions being pursued around the world. The course hopes to empower students to play an active role in international poverty reduction.

## ME 520 - Thermal Systems Design (4)

Introduction to the design of thermal systems for HVAC, energy conversion, and industrial process applications. Procedures for selection of fluid flow equipment, heat exchangers, and combustion equipment. Modeling performance of components and systems. Costestimation and economic evaluation. Design optimization.
Also offered for undergraduate-level credit as ME420 and may be taken only once for credit. .

## ME 521 - Heating, Ventilating, and Air Conditioning Design Fundamentals (4)

Fundamental principles and methods of controlling living space environments; design of heating, ventilating, air conditioning, and refrigeration systems for residential, commercial, and industrial purposes. Topics include: moist air properties (psychometrics), air conditioning processes, indoor air quality (comfort and health), heat transmis sion in building structures, solar radiation, space heating and cooling load analysis, energy calculations, and air conditioning systems and equipment.
Also offered for undergraduate-level credit as ME421 and may be taken only once for credit. .

## ME 522 - Building Energy Use Modeling (4)

Analysis of annual energy use of residential and commercial buildings. Emphasis on computersimulation techniques for analysis of building energy use and study of energy-efficient building design. Topics include: heat loss and gain in buildings, heating and cooling load calculations, energy use analysis, daylighting in commercial buildings, energy efficiency, green building technologies, and modeling for energy codecompliance. Project in design/simulation.

Also offered for undergraduate-levelcredit as ME422 and may be taken only once for credit.

## ME 523 -Fundamentals of Building Science (4)

Introduction to the fundamental concepts of building science. Buildings as a system, including interactions among subsystems such as heating and cooling, ventilation, the thermal envelope, air leakage, and occupants. Building energy efficiency. Performance of heating, cooling, and ventilating systems. Indoor air quality and otherhealth and safety issues, including assessing and resolving mois ture problems. Applications of common and cutting-edge building science measurement and monitoring tools. The class will include one lecture and one lab session each week. Some/all of the lecture portion of the course may be delivered online through course-management software. Group projects may involve laboratory meas urement, field monitoring, and/or computer simulation.

Also offered for undergraduate-level credit as ME423 and may be taken only once for credit. . Prerequisite: graduate standing in engineering or architecture.

## ME 524 -HVAC SystemDesign and Controls (4)

Design of HVAC equipment, integration of systems, and design of controls for buildings. Application of HVAC fundamentals. Subjects include: building, block and zone load estimates; air/hydronic systems design; refrigeration; air handling units; cooling and heating plants; basic control concepts; sensors and actuators; pneumatic, electronic, and digital controls; HVAC subsystemand controls; complete HVAC systems and controls.
Also offered for undergraduate-level credit as ME424 and may be taken only once for credit. . Prerequisite: ME 421/521 and ME351.

## ME 525 - Advanced Topics in Building Science (4)

Indoor environmental quality and sustainable built environments. Material balance principles applied to fate and transport of pollutants in urban and indoor environments; approaches for quantify ing and characterizing sources, transport, transformation, and control of indoor air pollutants; energy conservation and indoor air pollution; quantifying human exposures to air pollutants. Course includes assembly of building science sens ors on Arduino platform, calibration, and collection and analysis of primary data. Familiarity with differential equations and intro-level chemistry and fluid mechanics is recommended.
Also offered for undergraduate-level credit as ME425 and may be taken only once for credit.
ME 526 -Solar Engineering (4)
Overview of solar energy and its applications. Solar resources, solar economics, collectortechnology, solar
thermal systems, power generation, industrial applications, thermal storage, photovoltaics, and design of systems for effective utilization of solar energy.
Also offered for undergraduate-level credit as ME426 and may be taken only once for credit. .

## ME 527 - Phase Transformations and Kinetics in Materials (4)

Designed to facilitate understanding of the thermodynamic forces driving material phase transformations and the role that strain energy and interfacial energy play in producing or modifying these forces. Also explores microstructure, a fundamental topic of study for students in material and mechanicalengineering fields.
Also offered for undergraduate-level credit as ME427 and may be taken only once for credit. Prerequisite: Senior or graduate standing in Engineering.

## ME 528 -Scanning Electron Microscopy for Materials and Device Characterization (4)

The study of the design concepts and applications of scanning electron microscopy (SEM) and spectroscopy. Topics include electron optical principles, specimen preparation, and SEM imaging and interpretation. The spectroscopy of microanalysis covers qualitative and quantitative chemical analysis of materials. The lectures and lab sessions are integrated to enhance students? learning experience.
Also offered for undergraduate-level credit as ME428 and may be taken only once for credit. Corequisite: ME528L.
ME 528L - (0)
Corequisite: ME528.

## ME 529 - Transmission Electron Microscopy and Chemical Analysis of Materials (4)

Introduction to the theoretical concepts and practical applications of transmis sion electron microscopy (TEM) and spectroscopy for materials characterization. The chemical analys is techniques include energy dispersive Xray spectroscopy and electron energy loss spectroscopy.
The lab provides hands-on experiences for students to operate the state-of-the-art TEM and the attached analytical accessories.
Also offered for undergraduate-level credit as ME429 and may be taken only once for credit.

## ME 530 -Solid Mechanics (4)

This course provides the knowledge of mechanics, physics, and mathematics that concerns the behavior of solids under external actions including external forces, applied displacements, temperature changes, moisture diffusion, etc. Topics include kinematics of deformation and motion, Lagrangian strain tensor, Cauchy stress tensor, elasticity and plasticity.

Also offered as ME630 and may be taken only oncefor credit. . Prerequisite: undergraduate mechanics and engineering mathematics; ME313 or equivalent.

## ME 531 - Theory of Viscoelasticity (4)

Provides a foundation on chemo-hygro-thermo-mechanical behaviors of materials. Thermo-mechanical behaviors of polymeric materials and composites, creep and relaxation functions, nonlinear thermo-mechanical behaviors, properties of nonlinear thermo-viscoelastic stress-strain laws, creep rupture, and torsion of nonlinear bars and shells fundamental concepts of thermo-viscoelasticity with applications are covered in this course.
Also offered as ME631 and may be taken only once for credit. Prerequisite: ME313 or equivalent.

## ME 532 -Turbomachinery (4)

Application of thermodynamics and fluid mechanics principles to the analysis and design of various types of turbomachinery, including pumps, fans, compressors, and turbines. An advanced unified treatment is presented. Theory, operation, performance, use, and selection of turbomachines are discussed.
Prerequisite:ME322, 331.

## ME 537 -Mechanical Systems Design (4)

Objective of this course is to integrate various analysis methods in the context of design projects with realistic constraints. Emphasis is on defining problems, identifying solution methods, and synthesizing solutions while cons idering production and economic factors. Teamwork, communication skills, and ability to learn independently is highly emphasized.
Also offered for undergraduate-level credit as ME437 and may be taken only once for credit. .

## ME 538 - Fundamentals of MEMS and Micros ystems (4)

The underlying principles of physics, mechanics and materials science as they apply to MEMS will be covered and coupled closely with the basic and applied aspects of micros ystems engineering. Case studies involving the design, operation, fabrication and packaging of MEMS devices will be presented throughout theclass.

Also offered for undergraduate-level credit as ME438 and may be taken only once for credit. . Prerequisite: senior or graduate standing.

## ME 541 - Advanced Fluid Mechanics (4)

Partial differential equations governing the conservation of mass, momentum, and energy of Newtonian fluids are derived. Dimensional analysis is used to simplify the governing equations and in particular justify the as sumption of incompressible flow. Exact solution of the Navier-Stokes equations are presented. Boundary layer
approximations to the governing equations are derived, and both exact and integral solutions are obtained.

Also offered as ME641 and may be taken only once for credit. .

## ME 542 - Advanced Heat Transfer (4)

Advanced treatment of the principles of conductive and convective heat transfer. Analytic and numerical solutions of heat conduction problems. Laminar and turbulent convective heat transfer.

Also offered as ME642 and may be taken only once for credit.

## ME 543 - Advanced Engineering Thermodynamics (4)

Thermodynamics of physical and chemical systems with engineering applications: basic thermodynamic relationships; advanced techniques for their use; systems of variable composition; heat effects for reacting systems; equations of state, phase, and chemical equilibria for ideal and nonideal systems. To include one or more of several special topics: chemical kinetics; reactor analysis fundamentals; second law analysis of thermodynamic systems; introduction to statistical thermodynamics; advanced energy conversion systems.
Also offered for undergraduate-level credit as ME443 and may be taken only once for credit. Prerequisite: ME321.

## ME 544 - Microgravity \& Capillary Fluid Mechanics I (4)

Liquid-gas flows behave significantly different in the near absence of gravity. Such flows are dominated by surface tension, i.e. capillary forces. The principles of capillary phenomena and applied capillary fluidics are reviewed from empirical, theoretical, and numerical perspectives: concepts of surface tension, wetting, and geometry. Simplified analy ses are pursued to model spontaneous flows exploited in microfluidic engineering systems on earth and macrofluidic systems aboard spacecraft. Exposure to literature, lab demonstrations, numerics, and drop tower experimentation.
Also offered as ME644 and may be taken only once for credit. Prerequisite: ME541 (may be taken concurrently) and ME551.

## ME 545 - Advanced Topics in Thermal and Fluid

 Sciences (4)Course topics are chosen for relevancy to current technological practice concerned with thermal and fluid sciences. Each offering of this course focuses on a specific area and is not a survey. Examples include thermal management of electronic equipment and theoretical fluid mechanics.

Also offered for undergraduate-level credit as ME445 and may be taken only once for credit.

## ME 546 -Scaling and Asymptotic Analysis (4)

Scaling and Asymptotic and/or perturbation methods for the systematic simplification of complexproblems in engineering analysis are introduced. The techniques learned will find direct application in sy stemmodeling, data reduction, and guid ance of complexexperimentation and/ortesting and 3-Dcomputer model benchmarking. Applied mathematical techniques focus on, but are not at all limited to, thermal-fluids sciences.
Also offered as ME646. Prerequis ite:ME551.
ME 547 - Transfer and Rate Processes (4)
An advanced treatment of heat, mass, and momentum transfer. Development of the conservation laws, transport laws, transport properties, and basic analy tic solutions. Applications to heat transfer equipment, catalytic reactors, drying processes.
Also offered for undergraduate-level credit as ME447 and may be taken only once for credit. . Prerequisite: graduate standing.

## ME 548 -Applied Computational Fluid Dynamics (4)

Computational fluid dynamics (CFD) is presented as a design tool for analyzing flow and heat transfer. Algorithms implemented in commercial CFD packages are reviewed. Training in use of a commercial code is provided. Case studies reinforce fundamental understanding of flow and heat transfer, and highlight the implementation-specific aspects of commercial codes. An independent project is required.
Also offered for undergraduate-level credit as ME448 and may be taken only once for credit. . Prerequisite: ME 541/ME 641.

## ME 549-Thermal Management Measurement (4)

Provides a survey of laboratory -based techniques used to diagnose electronic cooling problems, and to obtain design data for developing thermal management solutions. Provides significant practical experience: students design and build theirown experiments; they take and analyze their own data. Measurements are made with handheld instruments, bench-top instruments, and with computer controlled data acquisition systems. Data reduction techniques involving centering (removal of bias error) and uncertainty analysis are usedextensively. Lecture and laboratory.
Also offered for undergraduate-level credit as ME449 and may be taken only once for credit. . Prerequisite: ME323, ME411.

## ME 550 -Solid Modeling (4)

Emphas is is on solid model construction methods using state-of-the-artsolid modeling software. Topics include use of parametric geometry, construction and modification
of solids, building and animating assemblies, working in groups, building sheet metal parts, drafting, and the presentation of the fundamentals of solids modeling including representation and manipulation of wireframes, surfaces, and solids. Lecture and laboratory.
Also offered for undergraduate-level credit as ME450 and may be taken only once for credit. . Prerequisite: senioror graduate standing in engineering or a closely related field.

## ME 551 -Engineering Analysis (4)

Application of mathematical techniques to the solution of controls, dynamics, mechanical, and transport phenomena problems. Emphasis given to modeling, physical interpretation, and normalization. Topics include modeling, linear systems, partial differential equations, and complex variables.
Also offered as ME651 and may be taken only once for credit. . Prerequisite: graduate standing.

## ME 552 - Control Engineering I (4)

Introductory controls class offered to upper-division mechanical engineering undergraduates and graduate students. Includes classicaltheory as applied to linear systems with topics: mathematical modeling of control systems; transfer functions and block diagrams; transient response; stability; root-locus method; frequency res ponse method; and control systemdesign techniques. Computer analys is and solution techniques will be utilized.
Also offered for undergraduate-level credit as ME452 and may be taken only once for credit. . Prerequisite: upperdivis ion ME undergraduate or graduate student; Mth 256; ECE 221; ME351.

## ME 553 - Control Engineering II (4)

Continuous control system design and applications using transferfunction and state variable approaches. Introduction to digital control systemdesign, including: transfer function and state space formulation, and time and frequency domain analy sis techniques. Computer analy sis and solution techniques will be utilized.
Also offered for undergraduate-level credit as ME453 and may be taken only once for credit. .Prerequisite: ME 452/552.

## ME 554 - Controls Engineering Laboratory (4)

Design, construction and implementation of continuous controllers using analog devices. Experimental identification of the dynamic properties of mechanical systems. Digital controllers introduced, implemented and compared with the corresponding continuous controllers. Expected preparation: ME453/553.
Also offered for undergraduate-level credit as ME454 and may be taken only once for credit. . Prerequisite: ME 452/552.

## ME 555 - Finite Element Modeling and Analysis (4)

The finite element method as related to the solution of mechanical des ign problems including thermal stress analys is. Various element formulations will be discus sed, and existing commercial codes will be used to demonstrate modeling and analysis techniques.

Also offered for undergraduate-level credit as ME455 and may be taken only once for credit. . Prerequisite:ME555: graduate standing in engineering.

## ME 556 -Mechatronics (4)

Students will gain an understanding of mechatronic (mechanical-electrical) systems and apply this knowledge directly in hands-on lab experiments. They will build circuits, collect sensor data, use a microcontroller, and control a motor. The format of the course will be one lecture and one lab per week.
Also offered for undergraduate-levelcredit as ME456 and may be taken only once for credit.

## ME 557 - Introduction to Robotics (4)

Robot kinematics dynamics and control; basic components of robots: controllers, power supplies and endeffectors; indus trial applications of robots using peripheral devices, sensors, and vision.

Also offered for undergraduate-levelcredit as ME457 and may be taken only once for credit. .

## ME 558 -Principles Of CNC Machining (4)

A study of principles of machining, tool path generation and analytic geometry, part design and programming, integration of CAD/CAM software, structure and control of CNC machines, and introduction to computer-integrated- manufacturing. Lecture and laboratory.

Also offered for undergraduate-level credit as ME458 and may be taken only once for credit.

## ME 560 - Control of Mechanical Systems using Microcontrollers Laboratory (4)

Basic interfacing and programming of microcontrollers for controls applications is introduced. Microcontrollers are interfaced with various external devices and sensors using A/D, D/A, and the SPIbus. Control of a motor driven mechanical device is implemented. A student selected final project in volving the control of a physical system is required.
Also offered for undergraduate-levelcredit as ME460 and may be taken only once for credit. . Prerequisite: ME 453/553 and ME454/554 (concurrent enrollment with ME 460/560 allowed).

## ME 561 - Buildings and health: Indoor air quality (4)

We spend $90 \%$ of our time inside buildings and much of our exposure to air pollution occurs indoors. Students
develop mass-balance models of pollutant fate, transport, and transformation for indoor spaces including parameterizing indoor sources (emissions), indoor-outdoor trans port (ventilation), transformation (removal and chemical reactions), and control strategies for indoor air pollutants. Students solvedeveloped models with analytical and numerical methods. Students use massbalance models to informassessment of human exposure to air pollution and infectious dis ease transmission.
Also offered for undergraduate-level credit as ME461 and may be taken only once for credit. Prerequisite: ME320 or equivalent.

## ME 562 - Engineering Numerical Methods (4)

Numerical methods applied to engineering problems. Coverage includes interpolation, integration, root solving, solution of boundary value and initial value problems, solution of linear systems. Programming will include Fortran or C, MATLAB and Maple.

Prerequisite: ME352.

## ME 563 - Advanced Topics in Control Engineering (4)

Mathematical foundations and applications of various advanced topics in control engineering for both continuous- and dis crete-time systems.

Also offered for undergraduate-level credit as ME463 and may be taken only once for credit. . Prerequisite: ME 453/553.

## ME 564 - Microgravity \& Capillary Fluid Mechanics II (4)

Advanced principles of capillary phenomenaand applied capillary fluidics are pursued by empirical, theoretical, and numericalmethods. Novel/publishable research projects are undertaken as teams or as individuals that exploit the unique experimental contributions of a 'low-gravity' drop tower to produce large length scale phenomena rarely observed in a terrestrial-gravity environment. Special applications are made to engineering systems aboard spacecraft.
Also offered as ME664 and may be taken only once for credit. Prerequisite: ME544.

## ME 565 - Advanced Finite Element Applications (4)

This course builds on the knowledge of introductory finite element modeling and analysis course to provide students with advanced working knowledge to tackle real world problems. Advanced elementtypes such as Plate and Shell as well as Gap and Contact will be discussed. Advanced modeling and analysis topics include nonlinearity in stress analys is(including geometric and material nonlinearity), Buckling, Gap/Contact analysis, forced vibration and frequency res ponse, advanced thermal/structural interactions, and mixed element modeling.

Also offered for undergraduate-levelcredit as ME465 and may be taken only once for credit. . Prerequisite: ME555 or equivalent.

## ME 571 - Process Measurement and Control (4)

Introduction to process control hardware, software, and interfacing. Lecture topics include: number systems, hardware concepts, data movement, programming, and interfacing. Lab exercises involve the use of microcomputers interfaced and programmed for various control and data acquisition applications. Lecture and laboratory.

Also offered for undergraduate-levelcredit as ME471 and may be taken only once for credit. . Prerequisite: ME 411/511; ECE 201, ECE 221.

## ME 574 - Rapid Prototyping, 3D Printing, and Additive Manufacturing (4)

Focus on rapid prototyping during an engineering design cycle to provide a comprehensive understanding of the methods, physical processes, resulting part attributes, and applications for the most common 3D printing technologies used by engineers. Both direct and indirect manufacturing processes are covered as well as some exposure to rapid manufacturing. Other topics include processing, part quality and metrology, 3D scanning, mesh manipulation and repair, and mechatronics review.
Also offered for undergraduate-levelcredit as ME474 and may be taken only once for credit.

## ME 576 -Materials Failure Analysis (4)

Fundamental mechanis ms related to failure of metal and alloys used in engineering structures. Mechanisms include: ductile and brittle fracture, fatigue, corrosion fatigue, wear, liquid erosion, stress corrosion, hydrogen-assis ted cracking, elevated temperature failures, and many others. Analytical tools used to identify types of failures including: optical metalography, scanning electron microscopy, secondary ion mass spectroscopy, electron probe microanalysis, X-ray photoelectron spectroscopy, Augerelectron spectroscopy, and others. Ductile, brittle, intergranular, cleavage, quasi-cleavage, and microvoid coalescence modes of fracture are discussed. Failures in weldments, brazed and soldered joints, castings, bearings, boilers, forgings, pipelines, bridge components, gears, springs, wear components, tools, and dies.

Also offered for undergraduate-level credit as ME476 and may be taken only once for credit. Prerequisite: ME314.

## ME 577 - Introduction to Semiconductor Manufacturing (4)

Introduction to semiconductor manufacturing technologies and its engineering field. Technologies studied include silicon wafermanufacturing, thermal processes, photolithography, ion implantation, etch, dielectric thin
films, metallization, chemical mechanical polishing, as sembly, sorting, and testing. Topics cover industry overview, technology trends and common engineering practices. The topics chosen are aligned with real fabrication facilities and are suitable for engineering and science students who want to be process, manufacturing, or equipment engineers in the semiconductor industry.

Also offered for undergraduate-level credit as ME477 and may be taken only once for credit.

## ME 578 - Introduction to Electronic Packaging (4)

This course provides a foundation on mechanical and materials aspects of electronic packaging as well as an understanding of the fundamental mechanical principles used in the design of electronic packages, boards, subsystems, and systems with focus on their integration. Topics include design, properties, materials, interconnections, assembly processes, performance of various packaging systems, thermal management, failure mechanis ms and reliability.

Also offered for undergraduate-level credit as ME478 and may be taken only once for credit. .

## ME 580 - Boundary Layers (4)

Presents boundary layers froma laminar and turbulent perspective. Derivation of the boundary layer equations of motion is carried out. Order of magnitude analy sis and similarity solutions are dis cussed. Specific cases of these flows are considered.

Also offered as ME680. Prerequisite: ME541 or equivalent.

## ME 581 - Mechanical Tolerancing (4)

Presents the principles of current dimensioning and tolerancing stand ards including their syntax, meaning, methods of verification, and their relation to design requirements. Statistical techniques for tolerance analy sis and synthesis relevant to various assembly and fit requirements. Other topics include standards of surface roughness, limits and fits, and relevant hardware and software products. A termproject on a mechanical part product intended for manufacturing is required.

Also offered for undergraduate-level credit as ME481 and may be taken only once for credit. . Prerequisite: ME241, ME 491 concurrently.

## ME 588 - Design of Industrial Experiments (4)

Presents the statistical basis of industrialexperimentation used in process and design improvement. Topics include model building, randomized and blocked designs, Latin squares, analysis of variance, factorial designs, fractional factorial designs, time series analysis, and evolutionary operations.
Prerequisite: Stat 451 CM.

## ME 596 -Design Optimization (4)

Application of Numerical Optimization techniques to engineering design process. Mathematical theory of optimization and application problems in structural and machine component design will be discus sed. The course involves computer-aided design optimization projects.

Prerequisite: graduate standing in engineering.

## ME 601 - Research (1-9)

(Credit to be arranged.) Consent of instructor.

## ME 603 -Dissertation (1-9)

(Credit to be arranged.) Consent of instructor.

## ME 604 - Cooperative Education/Internship (1-9)

(Credit to be arranged.) Consent of instructor.

## ME 605 - Reading and Conference (1-9)

(Credit to be arranged.) Consent of instructor.

## ME 606 -Special Projects (1-9)

(Credit to be arranged.) Consent of instructor.

## ME 607 -Seminar (1-9)

(Credit to be arranged.) Consent of instructor.

## ME 610 -SelectedTopics (1-9)

(Credit to be arranged.) Consent of instructor.

## ME 612 - Advanced Vibrations (4)

Vibration analysis of single and multiple degreeof freedom systems. Topics include: (1) modeling of linear systems using matrix methods; (2) modal analysis; (3) general forcing and Fourier series methods; (4) random and self excited vibrations; (5) nonlinear vibrations.

Also offered as ME512 and may be taken only once for credit. .

## ME 630 -Solid Mechanics (4)

This course provides the knowledge of mechanics, physics, and mathematics that concerns the behavior of solids under external actions including external forces, applied dis placements, temperature changes, moisture diffusion, etc. Topics include kinematics of deformation and motion,

Lagrangian strain tensor, Cauchy stress tensor, elasticity and plasticity.

Also offered as ME530 and may be taken only once for credit. .

## ME 631 - Theory of Viscoelasticity (4)

Provides a foundation on chemo-hygro-thermo-mechanical behaviors of materials. Thermo-mechanical behaviors of polymeric materials and composites, creep and relaxation functions, nonlinear thermo-mechanical behaviors, properties of nonlinear thermo-viscoelastic stress-strain laws, creep rupture, and torsion of nonlinear bars and shells fundamental concepts of thermo-viscoelasticity with applications are covered in this course.
Also offered as ME531 and may be taken only once as credit. Prerequisite: ME313 or equivalent.
ME 632 - Turbomachinery (4)
Application of thermodynamics and fluid mechanics principles to the analysis and design of various types of turbomachinery, including pumps, fans, compressors, and turbines. An advanced unified treatment is presented. Theory, operation, performance, use, and selection of turbomachines are discussed.

Prerequisite:ME322, 331.
ME 641 - Advanced Fluid Mechanics (4)
Partial differential equations governing the conservation of mass, momentum, and energy of Newtonian fluids are derived. Dimensional analysis is used to simplify the governing equations and in particular justify the as sumption of incompressible flow. Exact solution of the Navier-Stokes equations are presented. Boundary layer approximations to the governing equations are derived, and both exact and integral solutions are obtained.
Also offered as ME541 and may be taken only once for credit.

## ME 642 - Advanced Heat Transfer (4)

Advanced treatment of the principles of conductive and convective heat transfer. Analytic and numerical solutions of heat conduction problems. Laminar and turbulent convective heat transfer.

Also offered as ME542 and may be taken only once for credit.

ME 644 - Microgravity \& Capillary Fluid Mechanics I (4)

Liquid-gas flows behave significantly different in the near absence of gravity. Such flows are dominated by surface tension, i.e. capillary forces. The principles of capillary phenomena and applied capillary fluidics are reviewed from empirical, theoretical, and numerical perspectives: concepts of surface tension, wetting, and geometry.

Simplified analyses are pursued to model spontaneous flows exploited in microfluidic engineering systems on earth and macrofluidic systems aboard spacecraft. Exposure to literature, lab demonstrations, numerics, and drop tower experimentation.

Also offered for graduate credit as ME544 and may be taken only once for credit. Prerequisite: ME641 (may be taken concurrently) and ME651.

## ME 646 -Scaling and Asymptotic Analysis (4)

Scaling and Asymptotic and/or perturbation methods for the systematic simplification of complexproblems in engineering analy sis are introduced. The techniques learned will find direct application in systemmodeling, data reduction, and guidance of complexexperimentation and/or testing and 3-D computer model benchmarking. Applied mathematical techniques focus on, but are not at all limited to, thermal-fluids sciences.
Also offered for graduate-level credit as ME546 and may be taken only once for credit. Prerequisite: ME551.

## ME 651 - Engineering Analysis (4)

Application of mathematical techniques to the solution of controls, dynamics, mechanical, and transport phenomena problems.Emphas is given to modeling, physical interpretation, and normalization. Topics include modeling, linear systems, partial differential equations, and complex variables.

Also offered as ME551 and may be taken only oncefor credit. . Prerequisite: graduate standing.

## ME 654 - Integrated Computer-aided Design (4)

Presents several design analysis computer programs in an integrated fashion. Topics include geometric modeling, motion simulation, and finite element analy sis. Emphasizes the understanding of the fundamentals, proper use of programs, and interpretation of results.
Prerequisite: EAS 215, ME 314.

## ME 662 -Engineering Numerical Methods (4)

Numerical methods applied to engineering problems. Coverage includes interpolation, integration, root solving, solution of boundary value and initial value problems, solution of linear systems. Programming will include Fortran orC, MATLAB and Maple.
Prerequisite: ME352.

## ME 664 -Microgravity \& Capillary Fluid Mechanics II (4)

Advanced principles of capillary phenomenaand applied capillary fluidics are pursued by empirical, theoretical, and numerical methods. Novel/publishable research projects are undertaken as teams or as individuals that exploit the unique experimental contributions of a 'low-gravity' drop
tower to produce large length scale phenomena rarely observed in a terrestrial-gravity environment. Special applications are made to engineering systems aboard spacecraft.
Also offered as ME564 and may be taken only once for credit. Prerequisite: ME644.

## ME 680 - Boundary Layers (4)

Presents boundary layers from a laminar and turbulent pers pective. Derivation of the boundary layer equations of motion is carried out. Order of magnitude analy sis and similarity solutions are discussed. Specific cases of these flows are cons idered.
Also offered as ME580. Prerequisite: ME641 or equivalent.

## ME 688 - Design of Industrial Experiments (4)

Presents the statistical basis of industrialexperimentation used in process and design improvement. Topics include model building, randomized and blocked designs, Latin squares, analysis of variance, factorial designs, fractional factorial designs, time series analysis, and evolutionary operations.
Prerequisite: Stat 451 CM.

## ME 696 - Design Optimization (4)

Application of Numerical Optimization techniques to engineering design process. Mathematical theory of optimization and application problems in structural and machine component design will be discus sed. The course involves computer-aided design optimization projects.
Prerequisite: graduate standing in engineering.

## Mgmt - Management

## Mgmt 100 - How to Succeedin Business School (1)

Overview of campus and SBA resources, introduction to pers onal finance, group work and SBA student groups designed to give students an opportunity for major exploration within the SBA.

## Mgmt 199 -Special Studies (1-6)

(Credit to be arranged.)

## Mgmt 200 - Business School Basics: How to Get the Most out of the SBA (2)

This course is designed to enhance student success in the School of Business at Portland State University. The course will focus on tools specifically designed to help students survey appropriate career and academic choices,
learn more about campus res ources, and focus on skills specific to success in the university environment.

## Mgmt 299 -Special Studies (1-4)

(Credit to be arranged.)

## Mgmt 310 -Entrepreneurshipfor Sustainable Development (4)

Examines the key concepts of environmental and social entrepreneurship with sustainable development goals (SDGs ) as their guiding mis sion. We will use the SDGs as the foundational elements to consider how non-profits, social enterprises, and other companies attempt to address the goals through their various activities. Through these cases, we examine the as sumptions behind economic growth, production and consumption, as well as the resulting economic models, power dy namics, opportunities and challenges. This course may be repeated once for credit.

## Mgmt 351 -Human Res ource Management (4)

Studies thehuman resource management functions performed by the human resource manager as well as by the line executive or supervisor. Uses contemporary approaches and problems to analyze the entire process of performance management, including human resource planning/job design, selection and staffing, training and development, compensation, performance appraisal, and employee and labor relations. Also examines legal questions which affect human resource management.
Prerequisite: BA 302. Preference on the waiting list will be given to HRM-option students.

## Mgmt 398U-Managing the Innovation Process (4)

Experience innovation leadership via hands-on development of prototypes. Goals of this course are: to shift from the idea of resource and social compromise to a generative, innovative value creation that considers longterm goals for sustainable profitability and to train students in cross-functional innovation process leadership.

Mgmt 399 -Special Studies (1-6)
(Credit to be arranged.)

## Mgmt 399U- Special Studies (4)

(Credit to be arranged.)

Mgmt 401 - Research (1-6)
(Credit to be arranged.)

## Mgmt 402 - Independent Study (1-12)

(Credit to be arranged.)

## Mgmt 404-Internship(1-6)

(Credit to be arranged.)

## Mgmt 405-Reading and Conference (0-6)

(Credit to be arranged.) Consent of instructor.

## Mgmt 407-Seminar (1-6)

(Credit to be arranged.) Student-selected problems in businessoperation and management to be studied by the individual and discussed in group meeting under direction of academic staff.

## Mgmt 407U- Seminar (4)

(Credit to be arranged.)

## Mgmt 409-Practicum(1-12)

(Credit to be arranged.)

## Mgmt 410 -Selected Topics (0-6)

(Credit to be arranged.)

## Mgmt 421 - Design Thinking for Social Innovation (4)

Design Thinking is an iterative process used tocreate and refine products, services, or solutions to improve the human experience. Students will learn how these principles are used for social and environmental innovation by applying course assignments to their own ide for a new social venture (nonprofit, social enterprise, or sustainable business), or to an existing social venture of their choice.

Also offered for graduate-level credit as Mgmt 521 and Mgmt 521 S , and may be taken only once for credit. Prerequisite: Sophomore standing or higher, competitive PSU or trans ferGPA ( 3.0 or higher with consideration made for special circumstances), and satisfactory completion of short application.

## Mgmt 422 -Money Matters for Social Innovation (4)

Developing an effective financial model is essential for any social venture, whether a nonprofit, social enterprise, or sustainable business. Apply lean startup and customer development methodologies, develop a revenue model, explore nonprofit and business legalentities, and create financial forecasts. Students will apply course assignments to their own idea for a new social venture, or to an existing social venture of their choice.
Also offered for graduate-level credit as Mgmt 522S and may be taken only once for credit. Prerequisite: Sophomore standing orhigher, competitive PSU or transfer GPA (3.0 or higher with consideration made for special circumstances), and completion of short application.

## Mgmt 423 -Storytelling and Impact Measurement for

 Social Innovation (4)Mastery of storytelling and impact measurement is a key element for successful social innovation. Learn andutilize effective pers onal and org anizational storytelling skills, and develop a plan for measuring and reporting the social and environmental impacts of an organization. Students will apply course assignments to their own idea for a new social venture (nonprofit, social enterprise, or sustainable business), or to an existing social venture of their choice.
Also offered for graduate-level credit as Mgmt 523S, and may be taken only once for credit. Prerequisite: Sophomore standing or higher, competitive PSU or transfer GPA ( 3.0 or higher with consideration made for special circumstances), and completion of short application.

## Mgmt 428 - Team Processes (4)

Designed to provide the student with a working understanding, and practical skills, related to operating effectively in team settings. The influence of member personality and atributes on teamwork, motivating team members, developing effective teamprocesses, and constructive conflict management and team communication are some of the is sues that may be addressed. Also focuses on the development and use of a variety of teams prevalent in contemporary organizations and some of the challenges faced in using these teams in an optimal fashion.
Prerequisite: BA 302.

## Mgmt 432 -Multifamily Property Management (4)

Gives students an overview of multifamily property management, including operations, maintenance, management and leas ing of various types of apartment communities. The course will cover fundamental components of the human resources function for apartment communities, an overview of accounting and budgeting skills needed to meet a property owners' goals, fair
housing laws, key components of a maintenance plan, and fundamental marketing tools and analysis for multifamily properties.
Also offered for graduate-level credit as RE532 and may be taken only once for credit. Prerequisite: BA 332U.

## Mgmt 433-Commercial Property and Asset Management (4)

Explores management of differentclas ses of commercial real estate including office, retail, and industrial as well as management of a portfolio of real estate assets. Students will gain an understanding of the following areas of commercial property and asset management:
financial/budgeting, facility, management, and legal. Discus sions will cover leasing strategies and ways to enhance building value. Students will learn how to reposition an assetto increaseits value and how to bestuse technology to manage assets.
Also offered for graduate-level credit as RE533 and may be taken only once for credit. Prerequisite: BA 332U.

## Mgmt 441 - Collective Bargaining andLabor Negotiations (4)

Works hopgiving students hands-on experience negotiating individual and group contracts. Students will learn how to manage the employment relationship within a union environment, studying: the legalenvironmentofunions; negotiations theory and practice; and grievance resolution procedures. Students will devotesignificanttime in class to negotiating individual and group contracts, and will have ample opportunity to receivefeedback to improve their skills.
Prerequis ite: BA 302.

## Mgmt 442 -Human Resources Information Systems \& People Analytics (4)

Fundamental HR information system(HRIS) and people analytics concepts and best practices. Designed for Human Resources Management and Management majors. Topics include: HRIS management, development, and implementation; data analysis and visualization; data security and privacy; and data-related ethical and legal issues.
Also offered for graduate-level credit as Mgmt 542 and may be taken only once for credit. . Prerequis ite: Mgmt 351.

## Mgmt 445-Organizational Design andChange (4)

Study of organizations froma macro perspective. Emphasis will be on the implications of dynamic environments, innovation, and technology for organizational structure, design, and processes. Management of change froma multilevel perspective will also be addressed.

Prerequisite: BA 302.

## Mgmt 446 - Principles of International Management (4)

Study of the managerial functions and problems related to international business activity. The focus of this course is on the management of foreign trade, direct investments, and international operations. In addition, the political, economic, and cultural environments of international business are examined from the pers pective of management. Comparative management is also treated through the study of other management systems.

Also offered for graduate-level credit as Mgmt 546 and may be taken only once for credit. Prerequisite: BA 302.

## Mgmt 447 - The Power of Soul and Spirit in Business (4)

Seminar devoted to exploring what soul and spirit means in the context of today's workplace; its current relevance to business; strategies for injecting more soul and spirit into working environments; and methods for developing sensitivity and appreciation for this dy namic approach to being in the business world. Topics to be explored include methods for building community in the workplace; strategies for developing one's inner life; methods for fueling creativity; approaches to bringing one's whole self to work; and examining new methods of leadership.
Also offered for graduate-level credit as Mgmt 547S and may be taken only once for credit. . Prerequisite: BA 302.

## Mgmt 461 - Reward Systems and Performance Management (4)

Study of reward systempractices that aid in motivation, employee development, and productivity improvement to meet organization goals. Shows how job analysis data forms the information base for both compensation and performance appraisal processes. Includes an analytic study of traditional and evolving methods of compensation management, and relates this and performance apprais al processes to the broad performance management framework.

Also offered for graduate-level credit as Mgmt 561 and Mgmt 561 S and may be taken only once for credit. . Prerequisite: Mgmt 351 . Preference on waiting list will be given to HRM-option students.

## Mgmt 464 - Contemporary Leadership Issues (4)

Investigation of the ideas of what constitutes "effective leadership" as org anizations enter the 21st century. Various aspects of the new leadership paradigmare addressed. Students will develop an awareness of their personal leadership profile and capabilities and the is sues they will face as leaders in tomorrow's org anizations.
Prerequisite: BA 302.

## Mgmt 471 - Staffing and Employee Selection (4)

The staffing process includes the acquisition, selection, and placement ofemployees to achieve the strategic human resource goals of the organization. Topics covered include staffing strategies, human resource planning, legalissues, recruitment methods, selectiontechniques (e.g., biographical information, interviewing, ability tests, work samples, assessmentcenters), selection validation, and utility analysis.
Also offered for graduate-level credit as Mgmt 571 and Mgmt 571S and may be taken only once for credit. . Prerequisite: Prior completion of Mgmt 351. Preference on waiting list will be given to HRM-option students.

## Mgmt 481 - Entrepreneurship(4)

This course focuses on the entrepreneurial practices and tools for development of a start up company, for intrapraneurial efforts in growing business, and also directing a pers onal career path. Topics include innovation, idea generation, evaluation, financial analysis, feasibility, businessplanning development and competition.
Prerequis ite: admis sion to SBA.

## Mgmt 485 - Career Management and Digital Portfolio (2)

Integrates learning from across the business programand offers a redaction process for the student digital portfolio. The result is a portfolio ready for external consumption. Course content includes reflection on university learning, personal branding, theory of work and career and a pers onalized review of course and programgoals. Corequisite: BA 495.
Prerequisite: BA 301, BA 302, BA 303, BA 311, BA 325, BA 339, and BA 385. Corequis ite: BA 495.

## Mgmt 491 - Training and Development (4)

Training and development highlights the organization's commitment to its employees. The course looks at training needs analysis; the nature, types and methods of training; careerstages, paths, planning; retraining outdated workers; outplacement, evaluation of training effectiveness; longterm development programs; and processes of organization development.

Also offered for graduate-level credit as Mgmt 591 and Mgmt 591S and may be taken only once for credit. . Prerequis ite: Prior completion of Mgmt 351 . Preference on waiting list will be given to HRM-option students.

## Mgmt 493 - Human Resource Strategy (4)

This is the final course in the Human Resource Management sequence. Uses case analy sis, outside speakers, and a comprehensive project to provide an indepth, analytical study of human resource management and the tasks of the modern human resourceexecutive.

Focuses on transforming the HRM function for the modem corporation. Emphasizes the strategic aspect of HRM while studying executive-level decision making in all aspects of HRM. Preference on waiting list will be given to HRM-option students.
Prerequisite: Mgmt 351 , Mgmt 461 , $\operatorname{Mgmt} 471$.
Mgmt 501 -Research (1-9)
(Credit to be arranged.)

## Mgmt 503 - Thesis (1-9)

(Credit to be arranged.)

## Mgmt 504 - Internship(1-9)

(Credit to be arranged.)

## Mgmt 505 - Reading and Conference (1-12)

(Credit to be arranged.) Consent of instructor.

## Mgmt 506 -Special Projects (1-12)

(Credit to be arranged.)

## Mgmt 507 -Seminar (1-6)

(Credit to be arranged.) Student-selected problems in businessoperation and management to be studied by the individual and discussed in group meeting under direction of academic staff.

## Mgmt 507S -Seminar (0-8)

(Credit to be arranged.)

## Mgmt 509 -Practicum(1-9)

(Credit to be arranged.)

## Mgmt 509S - Practicum: Small Business Concepts II (18)

(Credit to be arranged.)

## Mgmt 510 -Selected Topics (1-9)

(Credit to be arranged.)

## Mgmt 510S - SelectedTopics (1-8)

(Credit to be arranged.)

## Mgmt 511 - Foundations of Strategy (2)

To survive and thrive in the global economy, organizations rely on leaders to analyze the competitive landscape, cultivate essential capabilities, and implement effective businessmodels. These are the key contributors to a successful strategy. This course imparts the analytical skills and tools necessary for leaders to assess the external environment and develop the internal capabilities required for devising and implementing strategies that will contribute to sustained competitive advantage.

## Mgmt 512 - Organizational Management (4)

Course participants explore org anizational behavior, leadership, and human res ource factors that contribute to long termvalue creation for the organization. Leadership emphas izes the creation and maintenance of relationships with key internal stakeholders as part of building organizational effectiveness, social res ponsibility and environmentalstewardship into organizational systems. Organizations are studied fromthree perspectives: the individual, the work team, and the organization al system. Topics include motivation, performance assessment, creative problemsolving and organizational learning, compensation, staffing, employee development, and organizational design and change.

## Mgmt 513 - Law Ethics and Stewardship (4)

The course is designed to providestudents with an understanding of how political, social, legal, regulatory, and environmental is sues impact business org anizations within a global context. Topics covered include legal is sues and compliance en vironments, business ethics, corporate social responsibility and the public policy process. Students gain an understanding of the relationships between values, ethics and legal and public policy environments, are able to as pire to high ethical standards, and build long-termstewardship of financial, societal and natural resources into an organization's strategy and operations.

## Mgmt 514 - Integrated Strategy (2)

This course provides an integrative, capstone experience focused on strategy development and implementation in international and domestic organizations. Case analysis and advanced analytical frameworks are used to develop the skills and judgment necessary to provide strategic direction to organizations. Both business-level and
corporate-level strategy development will be undertaken leading students to solidify their strategic mindset, which will be applicable across a broad range of organizations.
Prerequisite: Mgmt 511 and Fin 513.
Mgmt 515 -Information Systems and Technology in Organizations (4)

Course participants explore information, systems, and technology froma managerial responsibility perspective. This focus reflects prevailing industry expectations that business people be involved in decision-making and management related to information resources and enabling technologies. To this end, we consider strategic and operational initiatives in such areas as information management and analytics, information-technology governance, IT portfolio management, package and service selection, project management and systemimplementation, inter-organizational partnerships and sourcing, and ethical concerns related to technology design and information use. Managerial responsibility for social and environmental impacts as sociated with the management of information, systems and technology are explored.

## Mgmt 516 - Project Management (2)

Consideration of the various methods, techniques, and software tools of project management.

## Mgmt 517 -Negotiations for Managers (2)

Designed to provide a competitive ad vantage in negotiation in the context of a work environment where positive on-going relationships are essential. It explores the major theories and concepts of the field, giving students the chance to practice deal making and conflict resolution through participation in negotiation exercises.

## Mgmt 518 -Digital Transformation of Business (4)

In every industry, the adoption of digital technology is creating new opportunities and disrupting existing business models. This trend is compelling business leaders to examine how to re-invent their products, processes and strategies to stay competitive. Students will learn a systematic framework for assessing the opportunities and threats and formulating digital transformation strategies to respond effectively.

## Mgmt 519 - Digital Transformation: Security, Privacy \& Ethics (4)

Students will learn about the technologies, frameworks, and guidelines necessary for effective implementation of digital transformation initiatives in any industry. Students
will become familiar with various technologies required to digitally transformbusiness functions and frameworks for managing cybersecurity and privacy. The course concludes with a review of ethics in the digital economy. Students will study various case studies and get hands-on exposure to some of the digital technologies covered in the course.

## Mgmt 520 - Leading Organizational Change During Digital Transformation (4)

Students will learn a flexible framework for understanding and leading organizational change during dynamic digital transformation initiatives, gaining insights into how to adapt this framework to theirown unique work environments and career aspirations. This will lead to an increased ability to formulate strategic recommendations and propose alternative actions for designing digital transformation journeys. A leadership development plan will prepare students to adapt org anizational culture to take advantage of digital transformation.

## Mgmt 521 - Design Thinking for Social Innovation (4)

Design Thinking is an iterative process used to create and refine products, services, or solutions to improve the human experience. Students will learn how these principles are used for social and environmental innovation by applying course assignments to their own ide a for a new social venture (nonprofit, social enterprise, or sustainable business), or to an existing social venture of their choice.

Also offered for undergraduate-level credit as Mgmt 421 and may be taken only once for credit. Cross-Listed as: This is the same course as Mgmt 521 S and may be taken only once for credit.

## Mgmt 521S - Design Thinking for Social Innovation (4)

Design Thinking is an iterative process used to create and refine products, services, or solutions to improve the human experience. Students will learn how these principles are used for social and environmental innovation by applying course assignments to their own idea for a new social venture (nonprofit, social enterprise, or sustainable business), or to an existing social venture of their choice.

Also offered for undergraduate-level credit as Mgmt 421 and may be taken only once forcredit. Cross-Listed as: This is the same course as Mgmt 521 and may be taken only once for credit.

## Mgmt 522S - Money Matters for Social Innovation (4)

Developing an effective fin ancial model is essential for any social venture, whether a nonprofit, social enterprise, or sustainable business. Apply lean startup and customer development methodologies, develop a revenue model, explore nonprofit and business legalentities, and create financial forecas ts. Students will apply course assignments
to their own idea for a new social venture, or to an existing social venture of their choice.

Also offered for undergraduate-levelcredit as Mgmt 422 and may be taken only once for credit.

Mgmt 523S -Storytelling and Impact Measurement for Social Innovation (4)

Mastery of storytelling and impact meas urement is a key element for successful social innovation. Learn and utilize effective pers onal and org anizational s torytelling skills, and develop a plan for measuring and reporting the social and environmental impacts of an organization. Students will apply course assignments to their own idea for a new social venture (nonprofit, social enterprise, or sustainable business), or to an existing social venture of their choice.

Also offered for undergraduate-level credit as Mgmt 423 and may be taken only once for credit.

## Mgmt 531 - The Entrepreneurial Mindset (4)

The globaleconomy requires an entrepreneurial mindset. Working on their own idea or with a local entrepreneur, students will: assess their appetite for entrepreneurship; create a venture proposal to effectively attract stakeholders: employees, partners, in vestors, and customers; understand venture types and theirlifecycles to evaluate entrepreneurship as a career option.

## Mgmt 533 - Alliances and Acquisitions (4)

Strategic alliances have become an essential element in growing a business. This course studies various types of alliances such as acquisitions, joint ventures and licensing. Covers best practices and unsuccessful practices. Case study analysis and use of current events will illus trate these practices. Pays particular attention to valuecreation.

Prerequisite: MBA or MSFA admission.

## Mgmt 540 - HR Analytics Rapid Evidence Assessments (2)

Learn the skills neces sary to leverage existing research and evidence in order to produce key HRquestions and answers. Topics covered include framing appropriate questions, choosing research sources, conducting rapid evidence assessments, and understanding how to complete a critically appraised topic (CAT).

## Mgmt 541 - Introduction to HR Analytics (4)

Introduction to the foundations of human res ource (HR) analytics. Topics include theory and practice regarding HR information systems, psychological theory, descriptive, predictive, and prescriptive analytics, ethics, legal is sues, data privacy/security, and visualizations. Students will
engage in case analyses and reflections, and introductory data-management and analytics exercises.

## Mgmt 542 - HR Analytics Tools and Applications (4)

This course exposes students to HR analytic tools and applications. Students will learn how to analyze data to ans wer key questions. The coursecontinues the focus on information systems, ethics, and visualizations, with an emphas is on communicating findings. Hands-on exercises and analyses bring to life course topics.

## Mgmt 543 - HR Metrics and Analytics in Daily Operations (2)

Organizations vary regarding the extent to which they leverage HR metrics and analytics in daily operations. This course focuses on a variety of contemporary applications. Assigned readings and exercises informstudents about the advantages and disadvantages of different applications, and how to developeffective HR metrics and analytics.

## Mgmt 544 - Technology Management (4)

Course takes a systematic approach to managing technology and innovation. Addresses is sues of technology and competition, technology infrastructure, technology strategy, research and development, the roles of invention, innovation, research and development, product development, and other critical technology related topics. Coverage will also be given to issues related to product development as well as IT strategy and in-depth examination of the current technologies of the day.

## Mgmt 545 - Managing Innovation Performance (4)

Examines the non-technical, human side to the challenges of technological innovation management. Course topics include technical professional performance and productivity, high performing technical teams, managerial effectiveness, innovative work cultures, and organizational practices and policies that promote technological innovation and new product development. Practical applications of course concepts to actual work situations are emphasized.

## Mgmt 546 - Principles of International Management (4)

Covers the major challenges of managing internationally, including political risk as sessment, international strategy, structuring and controlling the multinational enterprise, international negotiations, and international human resourcemanagement. Course is targeted both toward
managers who work abroad as well as those dealing with international business from the home country.

Also offered for undergraduate-level credit as Mgmt 446 and may be taken only once for credit.

## Mgmt 547S - The Power of Soul and Spiritin Business (4)

Seminar devoted to exploring what soul and spirit means in the context of today's workplace; its current relevance to bus iness; strategies for injecting more soul and spirit into working environments; and methods for developing sensitivity and appreciation for this dy namic approach to being in the business world. Topics to be explored include methods for building community in the workplace; strategies for developing one's inner life; methods for fueling creativity; approaches to bringing one's whole self to work; and examining new methods of leadership.
Also offered for undergraduate-level credit as Mgmt 447 and may be taken only once for credit. . Prerequisite: Mgmt 512.

## Mgmt 548 -Special Topics in HR Analytics (2)

Selected topics in HR analytics for human resources professionals. Potential topics include Story telling with Data for HR, HR Data Visualizations, Addressing Evidence-Based HR Questions, HR Metrics, Recruitment and Selection, Training, Performance Management, Reward Systems, and Workforce Planning and Mobility.

## Mgmt 551 -Managing Human Res ources (4)

How do managers help their subordinates achieve great and sustainable performances? In the 21st century, the employment contract has undergone significant changes, with both the workforce and the organization being vastly different from their predecessors. Focuses on the daily strategies of generalists as they lead their subordinates to high long-termproductivity. Studies all aspects of the employee life cycle from selection through separation, including employee development, reward systems, performance management, and employeerelations. Emphas is on problems olving for practicing managers.

Prerequisite: Mgmt 512.

## Mgmt 552 -HR Analytics Capstone (4)

Continuation of the HR Analytics Tools and Applications course. It delves deeply into HR analytics, taking students from a beginner to an intermediate levelof proficiency in key HR analytical tools and strategies. Emphas is is placed on integrating data analytic approaches culminating in a term-long project.

## Mgmt 553 - HR Data Visualization andStorytelling (2)

Focuses on the importance of communicating data analytics findings to different audiences in a proficient, convincing, and compelling manner. The art of storytelling with data will focus on assembling key dataanalytics findings, creating data visualizations, and communicating the information to different stakeholders.

## Mgmt 554 - Negotiation and Conflict Resolution (3)

Examines negotiation as a sometimes rational, sometimes irrational social process used for res olving conflict. Studies the interdependence between parties which causes the conflict; focuses on effective and ineffective negotiating tactics between these competing groups. Explores the use of impartial third parties to facilitate negotiations. Practical applications include labor management relationships, purchase agreements, org anizational goal setting, etc.
Prerequisite: Mgmt 512.

## Mgmt 554S - Negotiation and Conflict Resolution (3)

Examines negotiation as a sometimes rational, sometimes irrational social process used for res olving conflict. Studies the interdependence between parties which causes the conflict; focuses on effective and ineffective negotiating tactics between these competing groups. Explores the use of impartial third parties to facilitate negotiations. Practical applications include labor management relationships, purchase agreements, org anizational goal setting, etc.

Prerequisite: Mgmt 512.

## Mgmt 555-Management of Organizational Change Negotiation and Conflict Resolution (3)

A seminar focused on the concepts, theories, and practice of managing organizational change and development. Class discussion will center on an examination of the history and assumptions of organizational development and change, the action research model and other foundations, plus a variety of org anization intervention techniques. Special is sues such as ethics in clientconsultant relationships will be integrated into class activities.

Prerequisite: Mgmt 512.

## Mgmt 556 - Organizational Politics andPower (4)

Incorporates theoretical and practical as pects of success in org anizations. Topics may include how to acquire, maintain, and use power; how to deal with superiors and subordinates; techniques for more quickly ris ing on the organizational ladder; misuses of power; developing effective relationships; ethical power use.
Prerequisite: Mgmt 512.

## Mgmt 561 - Reward Systems and Performance Management (4)

Study of reward systempractices that aid in motivation, employee development, and productivity improvement to meet organization goals. Shows how job analysis data forms the information base forboth compensation and performance appraisal processes. Includes an analytic study of traditional andevolving methods of compensation management, and relates this and performance apprais al processes to the broad performance management framework.

Also offered for undergraduate-levelcredit as Mgmt 461 and may be taken only once for credit. Prerequisite: Prior completion of or concurrent registration in Mgmt 512. Preference on waiting list will be given to HRM-option students. Cross-Listed as:This is the same course as Mgmt 561 S and may be taken only once for credit.

## Mgmt 561S - Reward Systems and Performance Management (4)

Study of reward systempractices that aid in motivation, employee development, and productivity improvement to meet organization goals. Shows how job analysis data forms the information base forboth compensation and performance appraisal processes. Includes an analytic study of traditional andevolving methods of compensation management, and relates this and performance apprais al processes to the broad performance management framework.

Also offered for undergraduate-level credit as Mgmt 461 and may be taken only once for credit. . Prerequisite: Prior completion of or concurrent registration in Mgmt 512. Preference on waiting list will be given to HRM-option students. Cross-Listed as:This is the same course as Mgmt 561 and may be taken only once for credit.

## Mgmt 562 - Business Strategy Capstone (4)

An integrative, capstone study of strategy formulation and implementation in international and domestic business enterprises. Case analysis and other appropriate methodologies are used to develop the skills and judgment neces sary to provide overall direction to the org anization. Specialemphasis will be placed on how to successfully match competitive strategy with effective implementation policies.
Prerequisite: Fin 551 or 561.

## Mgmt 571 -Staffing and Employee Selection (4)

The staffing process includes the acquisition, selection, and placement of employees to achieve the strategic human res ource goals of the organization. Topics covered include staffing strategies, human resource planning, legal issues, recruitment methods, selection techniques (e.g., biographical information, intervie wing, ability tests, work
samples, assessment centers), selection validation, and utility analysis.

Also offered for undergraduate-level credit as Mgmt 471 and may be taken only once forcredit. Prerequisite: Prior completion of or concurrent registration in Mgmt 512. Preference on waiting list will be given to HRM-option students. Cross-Listed as:This is the same course as Mgmt 571S and may be taken only once for credit.

## Mgmt 571S -Staffing and Employee Selection (4)

The staffing process includes the acquisition, selection, and placement of employees to achieve the strategic human resource goals of the organization. Topics covered include staffing strategies, human resource planning, legal is sues, recruitment methods, selection techniques (e.g., biographical information, interviewing, ability tests, work samples, assessment centers), selection validation, and utility analysis.
Also offered for undergraduate-level credit as Mgmt 471 and may be taken only once forcredit. . Prerequisite: Prior completion of or concurrent registration in Mgmt 512. Preference on waiting list will be given to HRM-option students. Cross-Listed as:This is the same course as Mgmt 571 and may be taken only once forcredit.
Mgmt 591 - Training and Development (4)
Training and development highlights the organization's commitment to its employees. The course looks at training needs analysis; the nature, types and methods of training; career stages, paths, planning; retraining outdated workers; outplacement, evaluation of training effectiveness; longterm development programs; and processes of organization development.
Also offered for undergraduate-level credit as Mgmt 491 and may be taken only once for credit. Prerequisite: Prior completion of or concurrent registration in Mgmt 512. Preference on waiting list will be given to HRM-option students. Cross-Listed as:This is the same course as Mgmt 591S and may be taken only once for credit.

## Mgmt 591S - Training and Development (4)

Training and development highlights the organization's commitment to its employees. The course looks at training needs analy sis; the nature, types and methods of training; career stages, paths, planning; retraining outdated workers; outplacement, evaluation of training effectiveness; longterm development programs; and processes of organization development.
Also offered for undergraduate-level credit as Mgmt 491 and may be taken only once forcredit. . Prerequisite: Prior completion of or concurrent registration in Mgmt 512. Preference on waiting list will be given to HRM-option students. Cross-Listed as:This is the same course as Mgmt 591 and may be taken only once for credit.

Mgmt 601 -Research (1-9)
(Credit to be arranged.)

Mgmt 607 -Seminar (1-9)
(Credit to be arranged.)

## Mgmt 694 -Methods and Models in Ecosystem Services (4)

Evaluates changing ecosystemservices in a holistic way, drawing multiple disciplines, including ecology, economics, eng ineering, and geographical and spatial sciences. Introduces methods and models frommultiple disciplines to analyze ecosystemservices across biophysical, social, economic, and cultural contexts. Provides an interdisciplinary foundation for evaluating ecosystemservices.

## Mgmt 698 - Ecos ystemServices Valuation: An Integrated Assessment (4)

Explore environmental, social and economic theories of valuation, quantitative and qualitative methods for incorporating the values intoecosystemservice management decis ions, novel approaches for integrating each type of values into comprehensive measures, and applications through interdisciplinary teamprojects. This is the same course as Ec 698; may only be taken once for credit.
Prerequisite:ESR 692, Soc 694 and Geog 696 or instructor's permission. Cross-Listed as:Ec 698.

MIM - Master of Intl Mgt
MIM 501 -Research (1-9)
(Credit to be arranged.)

MIM 502 - Independent Study (1-4)
(Credit to be arranged.)

MIM 504 -Cooperative Education/Internship (1-9)
(Credit to be arranged.)

## MIM 505 -Reading and Conference (1-8)

(Credit to be arranged.)

## MIM 506-Special Project (1-6)

(Credit to be arranged.)

MIM 507-Age of Pacific Seminar Series (1-9)
Special topics either under the sponsorship of the Ageof the Pacific Series or an elective course addressing contemporary business is sues in international bu siness.

## MIM 508-Workshop(1-9)

(Credit to be arranged.)

MIM 509-Practicum(1-9)
(Credit to be arranged.)

## MIM 510 - Age of Pacific Seminar Series (1-4)

Special topics either under the sponsorship of the Age of the Pacific Series or an elective course addressing contemporary business is sues in international business.

## MIM 512 - Global Leadership and Ethics (2)

This course provides students with a solid understanding of the concepts linking leadership to global and social systems, international organizational development, and the connection between leadership and systems. Global leadership is studied from three perspectives: the virtual teamleading across borders and org anizations, ethical and cultural ramifications of leadership and followership, and to emphasize leadership's impact on the social, environmental and economic context in which they operate.

## MIM 513 - Pacific RimEconomies, Trade, and Financial Markets (3)

The coursesurveys currenteconomic trends among the Pacific Rim economies, focusing on the challenges facing both developed and developing countries. Areas of focus include the principles of international trade, balance of payments, environmental impacts of policies, financial institutions and markets which all effect business between the Pacific Rim and the United States.

## MIM 514 - Global Managerial and Cost Accounting (2)

The course covers global managerial and cost accounting issues; it also focuses on the use of accounting information within the multinational firm. In addition, the course will
consider financialmodels used in analyzing the economic viability of new products and services. Students will also be exposed to activity based costing, standards and variance analysis, and inventory valuation.

## MIM 515 - Global Contemporary Marketing (4)

The global/international marketing strategies and operations of multinational corporations (MNCs) are studied through assessment of international markets, marketing environments, and various as pects of global marketing strategies and marketing management.

## MIM 516 - Contemporary Pacific Rimand World Affairs (4)

This course offers a broad sweep of the his tory, politics, economics, and foreign relations of the Asia Pacific Rim countries to enhance understanding of current business attitudes and systems across the region. Linking historical events with contemporary issues, the course will help predict how the region will shape the global business community into the future.

## MIM 517 - Accounting for Global Enterprises (4)

Study of international accounting is sues crucial for effective interpretation and understanding of international business. Goal of the course is to build a framework that can be used to analyze and understand financial reports used by multinational corporations (MNCs). Special managerial and control problems of MNCs, including performance evaluation, transfer pricing, and taxation will also be addressed.

## MIM 521 -Sustainability Metrics in Business (4)

Helps students develop an understanding of how the measurement of a global company's environmental and social performance contributes to business goals and strategies. Students examine how different global companies measure and report on their environmental and social performance, and how their different approaches link to business practices.

## MIM 522 -Global Communications (2)

Focus on a crucial global business leadership skill: the ability to inform and persuade across cultures through speaking, writing, and listening. Topics include reading, internalizing fundamental concepts, discussing communication challenges, and practicing communication skills. The course will use a workshop format focused on experiential and collaborative learning.

## MIM 524 - Global Sourcing andSupply (4)

This class is an overview of planning strategies and tactical execution for sustainable operational sourcing in a global environment. Topics to be reviewed include; locating and qualifying international suppliers, the strategies regarding outsourcing / off-shoring, supplier operational metrics and strategies, establishing and maintaining relationships, eprocurement, new product introduction, and quality systems with selected suppliers.

## MIM 527 - Intercultural Competence and Communications I (1)

Study of the process of communication, its various components, and how cultural, sociocultural, psychocultural, and environmental influences affect the outcome, including the role of non-verbal communication. Analysis of successful adaptation to new cultures, including developing a communication competence in a new culture and dealing with conflict. While the principles of cross cultural communication and adaptation are generic to all cultures, two cultural environments, China and Japan, will be studied in depth, to develop cultural self-awareness. This is the first course in a sequence of two: MIM 527 and MIM 528.

## MIM 528 - Intercultural Competence and Communications II (1)

Study of the process of communication, its various components, and how cultural, sociocultural, psychocultural, and environmental influences affect the outcome, including the role of non-verbal communication. Analysis of successful adaptation to new cultures, including developing a communication competence in a new culture and dealing with conflict. While the principles of cross cultural communication and adaptation are generic to all cultures, two cultural environments, China and Japan, will be studied in depth, to develop cultural self-awareness. This is the second course in a sequence of two: MIM 527 and MIM 528.

## MIM 531 - Product Design andStewardship for Sustainable Enterprises (4)

Takes the view that to maximize a company's competitive advantage, managers need to know how to identify opportunities to initiate changes in the firm's value chains that reduce was te and generate value. Addresses the principles of industrial ecology, environmental management systems, product stewardship and life cycle analys is, eco-efficiency and design for the environment. Case studies will be used to explore the practical
challenges and opportunities to implementation of product design and stewardship activities.

## MIM 534 - Global Logistics Management (4)

Includes studies of inventory and warehouse planning and control and the principles of transportation. Managing logistics in an international environment will be the primary focus, with special attention given to air and sea trans portation. Topics such as liner conferences and air freight will be included.

## MIM 535-Global Marketing Research and Innovation (3)

This course concentrates onhow to manage an innovation process, fromnew opportunity identification to market introduction, with emphasis on integrating appropriate market input at each step. Students will understand how to approach the identification of new opportunities, the rapid evaluation/ prioritization of these opportunities, and management of the development and introduction processes.

## MIM 541 - Global Social Innovation and Entrepreneurship (4)

This introductory course will apply the concepts of social entrepreneurship and social enterprise as a for-profit or a not-for-profit business model. It examines a range of ownership and market orientations and the role of stakeholder engagement. Students will examine social intrapreneurships within established companies and conduct real world research projects with social entrepreneurs. W orking with a client company, they will investigate a pressing business problemand provide recommendations; alternatively students will developa mini business plan for a new social venture and acquire techniques and roadmaps for identifying, analyzing and developing opportunities for market-based solutions to social problems.

## MIM 544 -Integrated Global Supply and Logistics Management (4)

Final course in the specialization in global supply chain management. Integrates allof the concepts contained within the previous three classes. Global supply and logistics planning and strategy development is the primary emphasis. Casecourse where each week students will be expected to analyze and prepare a supply and logistics case in an international setting. Emphas is on developing analytical and problem- solving skills and on generating the quantitative information necessary to make superior managerial decisions.

## MIM 545-Global Selling (4)

Focuses on helping students develop an understanding of Asian company purchasing practices and buyer behavior, and linking that understanding to the development of effective selling skills in a business-to-business environment and an understanding of effective $s$ ales management strategies and activities. The integration of sales automation technology and e-business will be discussed.

## MIM 551 - Managing and Leading International NonGovernmental Organizations (4)

Introduction to international non-governmental organizations and the contributions they make to the larger society. Develops an overall understanding of the relationship of strategic international NGO management and programeffectiveness. Step-by-step development of a strategic plan that flows logically from the mission of the org anization, the external environment, and org anizational goals and objectives. Studies strategic planning, grant development, project development, execution and evaluation, marketing, financial management and law as it pertains to international NGOs.
Prerequisite: MIM 511.

## MIM 558-Global Comparative Operations Management (4)

The changing international en vironmentin global operations will be reviewed through: comparative study of process selection, facilities design, operations planning and control, supply logistics, process best practices, technology management, international sustainable supply chains and customers, quality management, and performance measurement. The importance of operation's involvement from new product introduction to the sustainable end of a product lifecycle will be emphasized.

## MIM 561 - International Community Policy, Leadership and Decision-Making (4)

Focuses on the principles and strategies of community and economic development in relation to participatory role apprais al, livelihood strategies and assessments, and community leadership and decision making. How to identify the interrelationships and influence of human behavior, natural resources and economic circumstances. Also focuses particularly on economically-dis advantaged international communities. Methods of engagement between international non-governmental organizations, corporations, and communities to further their respective and mutual objectives are addressed. Recommended prerequisite: MIM 511.

## MIM 564 - Global Human Resource Management (4)

Examines the management of human resources in the international firm, including motivating and leading employees in multi-cultural contexts. Course begins with an analysis of the human resource management philosophies and approaches to industrial and employee relations in representative countries. Integration of human resource management systems in international firms, including the creation of global corporate culture, HR support for organizational learning and approaches to human resource management transfer across borders, are also studied. Also examines the nature of successful crosscultural teams and principles of leading change in multinational firms.

## MIM 568 -Managing Information Technology Globally (2)

Explores the crucial roles thatexecutives, managers, and business professionals play in selecting, sourcing, designing, and implementing information technologies, and in managing the business processes that produce value from those investments. Positions these issues in the context of the particularchallenges that arise in managing information technology across international boundaries and in global firms.

## MIM 571 -Global Strategic Cost Management (4)

Takes the perspective that global managers should use multiple approaches to developing and using accounting information for global companies. Special emphasis placed on understanding traditional costsystems, activity -based costing systems, cost management in global supply chains and determining the cost of quality. Relies heavily on the examination of actual globalcompany situations.
Prerequisite:MIM 574.

## MIM 572 -Global Business Valuation (4)

Focuses on financial analysis of the performanceof the global business or parts of the global business such as product or projects. Tools and techniques of financial statement analysis fromthe pers pective of chief financial and accounting officers, investors and creditors; development of models for determining and forecasting the profitability and financial position of the global firm. Business valuation techniques, emphasizing cash flow projections. Some issues in costs and risk management. Theoretical principles and practical approaches of valuation of a global business or business interest, including valuation strategies for specific purposes such as mergers, acquisitions, and corporate restructuring, multiSBU and international operations.

Prerequisite: MIM 574.

## MIM 573 - Cases in International Corporate Financial Management (4)

This final course in the MIM International Corporate Finance Specialization integrates concepts, tools and knowledge gained fromthe previous specialization coursework. Case analyses are used to enhance analytical and quantitative skills applied to real-world situations. All case work focuses on companies having international operations, with particularemphasis on the Asia-Pacific region.

Prerequisite:MIM 574, MIM 571, and MIM 572.

## MIM 574-International Corporate Finance and Investment (4)

Focus on investment and financing decisions of firms operating in more than one nation. Topics include international risk and value analysis, cross border capital budgeting and capital acquisitions, financing mix, working capital management of multinationals, foreign exchange risk and exposure management, estimating cost of capital international investment, international capital markets, and sources of financing.
Prerequisite:MIM 513,517.

## MIM 575 - Marketing in Asia and the Pacific Rim(4)

Study of marketing strategies and practices in Asian and other Pacific Rim countries. Markets, marketing environments, and marketing practices in selected Asian countries are analyzed. Planning, and managing marketing strategies and operations are also included.
Prerequisite:MIM 515, 516, 523, 547.

## MIM 577 - International Business Negotiations (3)

Examination of the theory andtechniques of negotiation, influencing, and dis pute resolution for forging mutually profitable business relationships, enhancing teamcohesion, and es tablis hing sustainable international partnerships. The course makes extensive use of negotiation role plays, out-of-class exercises, and panels by experienced negotiators.

## MIM 579 - Asia Field Study (4)

Students travel to Asia to vis it companies, meet with businessexecutives, and learn more aboutbusiness within the context of these cultures. This trip provides an opportunity to immerse in the culture and lifestyle of different Asian countries, while learning about global business.

## MIM 589 - Global Business Strategy (4)

The course will analyze business strategy as both a longterm plan and the translation of that plan into sustainable operational results. This course will examine how strategic decision-making can integrate social responsibility into a global business strategic plan. The course will focus on: the Pacific Rim, US and EU.

## MIM 700 - MIM Prerequisite (1-8)

(Credit to be arranged.)

## Mktg - Marketing

## Mktg 199-Special Studies (1-3)

(Credit to be arranged.)

## Mktg 338U- Professional Selling (4)

An overview of personal selling as an element of the marketing function for both industrial and retail profes sional sales with an emphasis on the sales process including prospecting, approaching, presenting, negotiating, closing and follow-up. Topics include sales careers, sales strategies and tactics, buyerbehavior as part of individual and group purchase processes, establishing and building customer relationships and the role of selling in the marketing effort. In addition to formal theoretical coursework, students practice sales skills in role plays, presentations and otherexercises requiring practical application of selling theory.

## Mktg 340U- Advertising (4)

An introductory course designed to provide an overview of marketing communications, plus an understanding of fundamental advertising issues and strategies. Course focuses on concepts, principles, processes, terminology, trends, and techniques which shape this constantly changing field including the impact of technology on messagedelivery.

## Mktg 341 -Public Relations (4)

Principles of public relations in contemporary America, with emphas is on the role of public relations in business.

## Mktg 363-Consumer Behavior and Customer Satisfaction (4)

Explores the determinants of consumer and business buying behavior. Applications of behavioral concepts to marketing strategy are emphasized along with how to measure, retain, and enhance customer satisfaction while developing long-termrelationships. The use of technology and databases in understanding the marketplace is explored.
Prerequisite: BA 311; six credits in psychology, sociology, or anthropology in any combination recommended.

## Mktg 373 -Merchandising Management (4)

This course focuses on the specific strategies and tactics used by retail, wholes ale, and manufacturing industry professionals to forecast, plan, execute, and achieve sales, inventory, turnover, gross margin, and profit objectives. Hands-on-practice will build realworld skills and insight and course will include contributions fromindustry professionals.

Prerequisite: BA 311.

## Mktg 375 - Retailing (4)

Focuses on the retail distribution of food and consumer goods to consumers with emphasis on the dynamic nature of the retail environment and how changes in consumer demographics, new technology, new competitive forms, and the Internet are revolutionizing the retail industry. Topics include: Staffing, management and retail operations, category management, web marketing, merchandising, and promotion.
Prerequisite: BA311.

## Mktg 376 - International Business (4)

International business concepts and practices relating to international trade are presented at a survey level. Current global is sues related to international trade and actual international problems are identified along with the basic concepts related to international finance, management, and marketing practices.

## Mktg 399 - Special Studies (1-6)

(Credit to be arranged.)

## Mktg 401 - Research (1-12)

(Credit to be arranged.)

## Mktg 404 - Internship (1-6)

(Credit to be arranged.)

## Mktg $\mathbf{4 0 5}$ - Reading and Conference (0-6)

(Credit to be arranged.) Consent of instructor.

## Mktg 407-Seminar (1-6)

(Cre dit to be arranged.) Student-selected problems in businessoperation and business management to be studied by the individual and discussed in group meeting under direction of academic staff.

## Mktg $\mathbf{4 0 9}$-Practicum(1-12)

(Credit to be arranged.) Field work involving the practice of professional activities away fromcampus.
Prerequisite: consent of instructor.
Mktg 410 -SelectedTopics (1-8)
(Credit to be arranged.)

## Mktg $\mathbf{4 3 5}$-Consumer Package Goods Marketing (4)

Examines marketing distribution systems used by food and consumer package goods (CPG) companies. Emphas is on describing CPG industry value chains and how business environmental factors impact the creation, delivery, and capture of customer value by different industry participants. Examines the marketing relationships between manufacturers, wholesalers, brokers, retailers, and cons umers. Topics include ECR, category management, Efficient Replenishment, retail trends in buyer behavior, ecommerce, new product introductions, Efficient Promotion, trade relations, industry alliances, competitive trends, channel roles and conflicts, and globalization.
Also offered for graduate-level credit as Mktg 535 and Mktg 535S and may be taken only once for credit. . Prerequisite: BA 311 orBA 339.

## Mktg 436 -Competitive Dynamics in the Athletic and Outdoor Industry (4)

Understand the distinctive challenges and insights of the athletic and outdoor industry. Examine the unique business practices of both manufacturers and retailers in this industry. Study such is sues as brand management, customer service, supply chain management, innovation, and sustainability in the athletic and outdoor industry.
Also offered for graduate-level credit as Mktg 536 and Mktg 536S and may be taken only once for credit. Prerequisite: BA 311.

## Mktg 437 -Product Management in the Athletic and Outdoor Industry (4)

Provides insight into the product planning process for apparel, footwear, and hard goods in the athletic and outdoor industry. Provides an overview and hands on group projectexperience of ideating, creating, producing, merchandis ing, marketing and delivering a product to market.
Also offered for graduate-level credit as Mktg 537 and Mktg 537S and may be taken only once for credit. . Prerequisite: BA 311.

## Mktg 440 - Practicum:FIR NW Student Ad Agency (4)

FIR NW is a student-run advertising agency within the School of Business that offers experience in development and execution of advertising, brand and communication strategy to solve business problems faced by communitybased businesses and organizations. Requirements: Application and acceptanceplus a minimum of 2 and a maximum of 3 terms in FIR NW. Open to students outside the bus iness school. Two terms of MKTG440: FIR NW waives MKTG443.
Prerequisite: Students must apply and be accepted into the program. Application involves submitting a resume and cover letter, and an interview with instructor.

## Mktg 441 -Media Strategy (4)

Examines the advertising media process as an outgrowth of marketing and advertising objectives. Focuses on strategic issues, quantitativedecision making, and media planning and negotiating techniques. This course is data intensive and analytical, with attention given to the Internet, local, and non-traditional mediums, as well as dominant national measured media.
Prerequisite: Mktg 340U.

## Mktg 442 - Creative Strategy (4)

Course puts into practice the theories, principles, and techniques of the advertising business loosely known as "creative." Course material will focus on the strategy behind advertising mes sages, techniques for writing and designing advertisements, and the unique requirements of different types of creative mes sages. Also includes creative considerations for specific media including those driven by technology.
Prerequisite: Mktg 340U.

## Mktg 443 - Advertising Campaigns (4)

Emphasis is on the development of total advertising campaign froma marketing perspective. Integrates elements of the advertising process such as setting objectives, selection of target markets, budget development, media selection, mes sage creation, production, development of presentation and recap
documents and the staging of a major promotional event using both traditional and emerging advertising media as available.
Prerequisite: Mktg 340U, Mktg 441, and Mktg 442.

## Mktg 444 - Advertising Account Management (4)

Course for college seniors who aspire to a career in advertis ing agencies as account managers as well as students who aspire to a career in advertising media or advertising creative positions working with account managers. Course will cover contemporary topics in account service, client relations, skill building, and career planning. Course format is intended to be highly interactive, with numerous guest lectures fromad executives, case problems, written assignments, reading as signments, agency visitations, and at least one project.
Prerequisite: Mktg 340U.

## Mktg 445 - National Student Advertising Competition (2)

A three-term, advanced learning course which is part of a national competition and is offered in conjunction with the American Advertising Federation. Participants will form a traditional advertising agency and develop a national campaign for a national brand company. Campaign development focuses on research, creativestrategy, the media plan, ad production, integration of promotional and interactive components, presentation, and budgeting. This is the first course in a sequence of three: Mktg 445, Mktg 446 and Mktg 447.

Prerequisite: Mktg 340U, Mktg 441, and Mktg 442.

## Mktg 446 - National Student Advertising Competition (4)

A three-term, advanced learning course which is part of a national competition and is offered in conjunction with the American Advertising Federation. Participants will form a traditional advertising agency and develop a national campaign for a national brand company. Campaign development focuses on research, creative strategy, the media plan, ad production, integration of promotional and interactive components, presentation, and budgeting. This is the second course in a sequence of three: Mktg 445, Mktg 446 and Mktg 447.
Prerequisite: Mktg 340U, Mktg 441, and Mktg 442.

## Mktg 447 - National Student Advertising Competition (2)

A three-term, advanced learning course which is part of a national competition and is offered in conjunction with the American Advertising Federation. Participants will form a traditional advertising agency and develop a national campaign for a national brand company. Campaign development focuses on research, creatives trategy, the media plan, ad production, integration of promotional and
interactive components, presentation, and budgeting. This is the third course in a sequence of three: Mktg 445, Mktg 446 and Mktg 447.
Prerequisite: Mktg 340U, Mktg 441, and Mktg 442.

## Mktg 448 - Digital Media Planning and Analytics (4)

This course will dive deeply into the specific strategies and skills required to use digital media as part of an Integrated Marketing Communications (IMC) plan. The emphasis is on the fundamentals of web analytics as a tool for optimizing digital marketing strategies and marketing ROI. Web analytic tracking from various social media platforms is used to as sess online customer behavior (i.e. webs ite traffic, click-through rates, conversion rates), to evaluate multi-digital channel performance, and to serve as the basis for assessing cost of customer acquisition and marketing ROI across channels and between communication campaigns.
Prerequisite: BA 311.

## Mktg 449 - Portfolio Workshop (2)

Three-day weekend intensive designed to stretch students’ ability to quickly as sess business problems, gather research and prepare creative communication strategy for presentation to clients. Students work for real clients, who judge presentation one week after faculty critique. Helps build stuent portfolio work.
Prerequisite: BA 311 and Mktg 340U.

## Mktg 450 - Product Innovation and Management (4)

Product innovation is at the core of the marketing process. The Internet has changed the rules of product de velopment by erasing competitive barriers and emphasizing rapid development cycles. The class will focus on identifying new productopportunities, rapid innovation procedures, the management of the development process, and alignment with e-marketing strategy.
Prerequisite: BA 311.

## Mktg 452 - Business-to-Business Marketing (3)

Management of the marketing activities of enterprises serving business-to-business markets. The course includes industry and competitor analysis, the fundamentals of competitive advantage and the role of product, price, distribution, and promotion in the creation of competitive market strategies.
Prerequisite: BA 311.

## Mktg 455 - Technology Marketing (4)

Survey of Internet-based marketing strategies with special focus on the Web in business-to business and business-tocons umer situations. The course encompasses the strategic market planning and implementation processes as applied to e-business including identifying and analyzing e-market
opportunities, data warehousing/ mining, developingeproducts, creating the customer interface, e-pricing, ebranding, and e-positioning strategies. Additional emphasis is on creating and leveraging a strategic Web presence with portals, partnerships, community building, and permis sionbased marketing.

Also offered for graduate-level credit as Mktg 555 and may be taken only once for credit. Prerequisite: BA 311.

## Mktg 460 - Marketing Research (4)

Studies the planning, datacollection, analy sis, and reporting is sues relating to marketing research. Key issues include defining information needs, sampling, using conventional methods and information technology to obtain primary and secondary data, instrument design, statistical data analysis, interpretation and reporting of data.

Prerequisite: BA 311.

## Mktg 461 -eMarketing (4)

Examines important marketing is sues in a business world that is being transformed by wides pread adoption of the Internet and related technologies. Topics include customer relationship management, effects of Internet on productrelated is sues (such as branding and new product development), pricing, distribution, and promotion, security, and privacy concerns.
Also offered for graduate-level credit as Mktg 561 and Mktg 561S and may be taken only once for credit. . Prerequisite: BA 311.

## Mktg 462 -Marketing Analytics (4)

Designed to introduce fundamental marketing analy tic concepts and best practices to support operational, org anizational, and marketing decision making. Analytic tools applied to secondary data which includes consumer spending patterns (i.e. dollars spent, frequency of purchase and products/services purchased), market data (i.e. data captured at the point of sale), and/or individual data in response to marketing offers online (i.e. email or web advertisements) or in-store. This course will emphasize the analysis and modeling of customer information as a means of building and managing customer relationships and developing marketing strategy.
Also offered for graduate-level credit as Mktg 562S and may be taken only once for credit. . Prerequis ite: BA 311 and BA 325.

## Mktg 463 -Service Innovation (4)

This course is focused on the is sues that confront marketing managers as they address the development of innovative services and service-oriented marketing strategies. It will cover new service design and development, standards, strategy, delivery, and service
management with special attention to the technologyenablement of service business models.

Prerequisite: BA 311.

## Mktg 464 - Mark eting Strategy and Management (4)

Caps tone marketing course that focuses on the development of the marketing plan. The emphasis is on integrating the major areas of marketing management including customer identification, industry analysis, product and communication strategies, distribution, pricing, and control in an e-business environment.

Prerequisite: BA 311 and Mktg 460.

## Mktg 466 - Principles of International Marketing (4)

Differences between domestic and international marketing are examined. A market-oriented conceptual foundation relating international channels of distribution, financing, documentation, tran sportation organizing, and staffing is presented.
Prerequisite: BA 311.

## Mktg 467 -Sales Management (4)

Survey of the sales management function with attention to sales force selection, allocation of sales effort, motivation and reward of sales force, sales automation tools, and the integration of sales with e-business strategy.

Prerequisite: BA 311.
Mktg 501 - Research (1-9)
(Credit to be arranged.)

## Mktg 503 - Thesis (1-9)

(Credit to be arranged.)

## Mktg 504 - Internship (1-9)

(Credit to be arranged.)

## Mktg 505 - Reading and Conference (1-6)

(Credit to be arranged.) Consent of instructor.

## Mktg 507 -Seminar (1-6)

(Credit to be arranged.) Marketing Trends and Developments. Marketing Information Systems. Marketing Models. Export Planning for Executives. Sales Force Management.

## Mktg 507S - Seminar (1-6)

(Credit to be arranged.) Marketing Trends and Developments. Marketing Information Systems. Marketing Models. Export Planning for Executives. Sales Force Management.

## Mktg 509 - Practicum(1-9)

(Credit to be arranged.) Field work involving the practice of profes sional activities away fromcampus.
Prerequisite: consent of instructor.
Mktg 510 -Selected Topics (1-8)
(Credit to be arranged.)

## Mktg 510S -SelectedStudies (1-8)

Credits to be arranged.

## Mktg 512 -Marketing Strategy (4)

Entrepreneurial, medium- and large-size org anizations are considered in terms of how they develop and implement a marketing strategy. Topics include the role of marketing in a competitive environment, market segmentation, selection of target markets, development of product, pricing, packaging and distribution strategies, as well as social and 'green' marketing strategies.

## Mktg 513 -Pioneering Innovation (4)

This course provides students with an understanding of the innovation process and its relationship to creating and managing organizations that can be sustained in the global economy. Consideration of the customer and the customer/firminterface is emphasized. Additionally the course will include methods for fos tering thecreative process.

## Mktg 514 -Selling andSales Leadership (4)

Students will study selling as a key component of an org anization's overall marketing effort. Specific topics will include the sales process, the crucial role of the sales leader, the relationship of sales and marketing, working with channel partners and key is sues in recruiting, training, motivating and compensating a sales force. We will focus on business-to-business selling but much of what we learn could be applied to a business-to-business-to-consumer sales environment.

## Mktg 534 - Advertising and Brand Management (4)

Explores how marketing communications support strategic brand management in a changing media and consumer landscape. Examines changes in technology, consumer behavior and brand significance and their effects on the advertis ing industry. Courseemphasizes strategic thinking and creativity, and helps prepare students to effectively contribute to brand building within a firm.

## Mktg 535 - Consumer Package Goods Marketing (4)

Examines marketing distribution systems used by food and consumer package goods (CPG) companies. Emphasis on describing CPG industry value chains and how business environmental factors impact the creation, delivery, and capture of customer value by different industry participants. Examines the marketing relationships between manufacturers, wholesalers, brokers, retailers, and consumers. Topics include ECR, categ ory management, Efficient Replenishment, retail trends in buyer behavior, ecommerce, new product introductions, Efficient Promotion, trade relations, industry alliances, competitive trends, channel roles and conflicts, and globalization.

Also offered for undergraduate-level credit as Mktg 435 and may be taken only once for credit. Cross-Listed as: This is the same course as Mktg 535S and may be taken only once for credit.
Mktg 535S - Consumer Package Goods Marketing (4)
Examines marketing distribution systems used by food and consumer package goods (CPG) companies. Emphas is on describing CPG industry value chains and how business environmentalfactors impact the creation, delivery, and capture of customer value by different industry participants. Examines the marketing relationships between manufacturers, wholesalers, brokers, retailers, and consumers. Topics include ECR, categ ory management, Efficient Replenishment, retail trends in buyer behavior, ecommerce, new product introductions, Efficient Promotion, trade relations, industry alliances, competitive trends, channel roles and conflicts, and globalization.

Also offered for undergraduate-level credit as Mktg 435 and may be taken only once for credit. . Prerequisite: BA 311 or 339. Cross-Listed as:This is the same course as Mktg 535 and may be taken only once for credit.

## Mktg 536 - Athletic and Outdoor Marketing (4)

Understand the distinctivechallenges and insights of the athletic and outdoor industry. Examine the unique businesspractices of both manufacturers and retailers in this industry. Study such is sues as brand management, customer service, supply chain management, innovation, and sustainability in the athletic and outdoor industry.

Also offered for undergraduate-levelcredit as Mktg 436 and may be taken only once for credit. . Cross-Listed as: This is the same course as Mktg 536S and may be taken only once for credit.

## Mktg 536S - Athletic and Outdoor Marketing (4)

Understand the distinctivechallenges and insights of the active and outdoor industry. Examine the unique business practices of both manufacturers and retailers in this industry. Study such is sues as brand management, customer service, supply chain management, innovation, and sustainability in the athletic and outdoor industry.

Also offered for undergraduate-level credit as Mktg 436 and may be taken only once for credit. . Prerequis ite: BA 311. Cross-Listed as: This is the same course as Mktg 536 and may be taken only once for credit.

## Mktg 537 - Product Management in the Athletic and Outdoor Industry (4)

Provides insight into the product planning process for apparel, footwear, and hard goods in the athletic and outdoor industry. Provides an overview and hands on group projectexperience of ideating, creating, producing, merchandising, marketing and delivering a product to market.

Also offered for undergraduate-levelcredit as Mktg 437 and may be taken only once for credit. Cross-Listed as: This is the same course as Mktg 537S and may be taken only once for credit.

## Mktg 537S - Product Management in the Athletic and Outdoor Industry (4)

Provides insight into the product planning process for apparel, footwear, and hard goods in the athletic and outdoor industry. Provides an overview and hands on group projectexperience of ideating, creating, producing, merchandising, marketing and delivering a product to market.

Also offered for undergraduate-levelcredit as Mktg 437 and may be taken only once for credit. .Prerequisite: BA 311. Cross-Listed as: This is the same course as Mktg 537 and may be taken only once for credit.

## Mktg 546 - Buyer Behavior and Communication (4)

Study of determinants and influences on purchasing behavior emphasizing contributions frombehavioral sciences. Course explores application of competitive and technological influences on buyers behavior and marketing strategy. Emphasis on marketing communication and promotion.

## Mktg 547 -Distribution Strategies (3)

Examines the fundamental and emerging trends in distribution activities of business enterprises. Course
analyzes the competitive adv antage(s) as sociated with distribution strategies. Explores trends in channel design, the changing role of participants, channel relationships, and channel communications.

## Mktg 548 - New Products Management (4)

Reviews the product innovation management process. Major topics include opportunity identification, concept generation, project evaluation, design and development, product launch strategies, and product management. Special consideration will be given to aligning product development with technology-driven, high-growth market opportunities.

## Mktg 551 - Managing Marketing Information (3)

Study of the uses and implementation of tools, methods, processes, and systems for managing marketing information. Emphasis will be placed on the determination of information needs for marketing decisions, the methods, processes, and systems foreffective and efficient management of marketing information, as well as the new marketing approaches and tools that utilize information technology for marketing products and services.

## Mktg 552 - eServices Marketing (4)

Focuses on understanding the distinction between service versus product marketing with an emphasis on assessing, designing, and managing on-line serviceofferings. eService relationships will be examined within a customer loyalty framework that considers customer value, switching costs, and on-line relational bonds as key drivers of loyalty.

## Mktg 555 - Technology Marketing (4)

Designed to introduce students to the special is sues faced by managers marketing technology products in markets characterized by rapid change. Topics include identification of market opportunities, market segmentation, positioning, product innovation, customer value creation, managing the customer interface, and new approaches to dis tribution. Emphasis will be on strategies for marketing technology products in an e-business environment.

Also offered for undergraduate-level credit as Mktg 455 and may be taken only once forcredit.

## Mktg 560 - Research for Mark eting Decisions (4)

Designed to study the methods of gathering primary and secondary information for business decisions. Also designed to study how to become a good information user.

Emphasizes the planning, design, and implementation of quantitative andqualitative research projects to obtain information from internal and external business environments. Considers the evaluation and appropriate use of information, information sources and research services.

Prerequisite: ISQA 511.

## Mktg 561 -eMarketing (4)

Examines important marketing is sues in a business world that is being transformed by wides pread adoption of the Internet and related technologies. Topics include customer relationship management, effects of Internet on productrelated is sues (such as branding and new product development), pricing, distribution, and promotion, security, and privacy concerns.

Also offered for undergraduate-level credit as Mktg 461 and may be taken only once for credit. Cross-Listed as: This is the same course as Mktg 561S and may be taken only once for credit.

## Mktg 561S - eMarketing (4)

Examines important marketing is sues in a business world that is being transformed by wides pread adoption of the Internet and related technologies. Topics include customer relationship management, effects of Internet on productrelated is sues (such as branding and new product development), pricing, distribution, and promotion, security, and privacy concerns.

Also offered for undergraduate-level credit as Mktg 461 and may be taken only once for credit. . Prerequis ite: BA 311. Cross-Listed as: This is the same course as Mktg 561 and may be taken only once for credit.

## Mktg 562S - Mark eting Analytics (4)

Designed to introduce fundamental marketing analytics concepts and best practices to support operational, organizational, and marketing decision making. Analytic tools applied to secondary data which includes consumer spending patterns (i.e. dollars spent, frequency of purchase and products/services purchased), market data (i.e. data captured at the point of sale), and/or individual data in response to marketing offers online (i.e. email or web advertisements) or instore. This course will emphasize the analysis and modeling of customer information as a means of building and managing customer relationships and developing marketing strategy.

Also offered for undergraduate-level credit as Mktg 462 and may be taken only once for credit. Prerequisite: Mktg 512.

## Mktg 566 - Global Mark eting Management (4)

Examines and provides a framework for study of the global marketing environment as well as the management of global marketing enterprises and global marketing
practices. Encompasses the preparation for global competition, assessment of environmental forces, and strategic and operational planning for marketing in the globalenvironment. Also examines the management of international, multinational and global marketing enterprises and their marketing activities.

## Mktg 567 - Sales Force Management (3)

Involves a detailed study of the sales management function. Issues to be addressed include designing the sales force, setting objectives, developing strategy, recruiting, evaluating, compensating, and controlling the program. Special attention is given to integrating the sales force with e-business strategy.

## Mktg 601 - Research (1-9)

(Credit to be arranged.)

## Mktg 607 -Seminar (1-9)

(Credit to be arranged.)

## MSE - Materials Science Engineering

## MSE 501 - Research (1-9)

(Credit to be arranged.)

MSE 503 - Thesis (1-12)
(Credit to be arranged.)

MSE 504 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

## MSE 505 - Reading and Conference (1-6)

(Credit to be arranged.)

## MSE 506 - Special Projects (1-12)

(Credit to be arranged.)

MSE 507 -Seminar (1-4)
(Credit to be arranged.)

## MSE 510-Special Topics (1-4)

(Credit to be arranged.)

## MSE 513 - Engineering Design for Materials Scientists (4)

Application of engineering design principles to materials problems:problemdefinition, design methodology, design philosophy, and practice. Introduction to fundamentals of machine design, mechanical models, mechanical systems. Required course for materials science and engineering students without an engineering background.

Prerequisite: graduate standing.

## MSE 515 -Material Testing Methods (4)

Discussion and application of techniques for materials scientists including image analysis, thermal-physical analyses, fracture, and weldability testing. Lecture and laboratory.
Prerequisite: graduate standing.
MSE 547 - Diffusion (4)
The mathematics, physics, and applications of diffusion theory in materials science. Topics include carburization, nitriding, and sensitization of metals; oxidation and ion implant in semiconductors, and polymer diffusion.

Prerequisite: Mth 261, EAS 213, graduate standing.

## MS - Military Science

## MS 111 -Basic LeadershipSkills (1)

Teaches basic leadership skills based on military training doctrine. Students will be introduced to BE-KNOW-DO method of leadership and learn how to apply it to small group leadership situations.

## MS 112 - Roles of the Army (1)

A study of the Total Army it's concepts and role in society. Examines missions, organization, personnel, and history of the Regular Army, National Guard and Reserves.

## MS 113 - Adventure Training (1)

The examination and practical application of Bas ic Rifle Marks manship, rappelling, mountain climbing, and basic first aid. An optional once a month field trip is offered for more extensive experience.

## MS 121 - Leadership Lab (0)

Provides practical experience in selected military skills and drill and ceremonies. Permits the exercise and evaluation of leadership skills in a controlled situation. Taken in conjunction with MS classes.

## MS 122 - Basic LeadershipLab (1)

Contact department for a description of this course.

## MS 123 - Basic LeadershipLab (1)

Contact department for a description of this course.

## MS 131 - Army Physical Fitness Training (1)

The course is designed to introduce students to the basics of physical fitness training as designed by the Army. An Army Master Physical Fitness Instructor instructs it.
Participants will train to pass (score of 180 or above) the Army Physical Fitness Test, which is a combination of push-ups, sit-ups, and a 2-mile run.

## MS 132 - Basic Physical Fitness (1)

Contact department for a description of this course.

## MS 133 - Basic Physical Fitness (1)

Contact department for a description of this course.

MS 180 - Personal Physical Fitness (1)
Contact department for a description of this course.

## MS 190 - Conduct-Pers Physical Fitness (1)

Contact department for a description of this course.

## MS 199-Special Studies (1-4)

(Credit to be arranged.)

## MS 211 -Land Navigation (2)

Teaches basic topographic map reading skills and land navigation using a lensatic compass and terrain as sociation. Includes practical exercises.

## MS 212 -Leadership and Management (2)

Introduction to fundamental leadership and management including problemanalysis, decision-making, planning, management control, and interpersonal skills. topics such as professional ethics, teamdevelopment, and oral communication skills.

## MS 213 -Basic Military Skills (2)

The course teaches basic military skills in first aid, wireless communication, land navigation, weapons systems, and s mall group leadership techniques.

## MS 215 -Fundamentals of Military Science (3)

Contact departmentfor a description of this course.

## MS 216 -Basic Military Science (6)

Contact department for a description of this course.

## MS 221 -Leadership Lab (1)

Contact departmentfor a description of this course.

## MS 222 -Basic LeadershipLab (1)

Contact departmentfor a description of this course.

## MS 223 -Basic LeadershipLab (1)

Contact department for a description of this course.

## MS 231 -Basic Physical Fitness (1)

Contact departmentfor a description of this course.

## MS 232 -Basic Physical Fitness (1)

Contact departmentfor a description of this course.

## MS 233 -Basic Physical Fitness (1)

Contact departmentfor a description of this course.

## MS 240-OCS Phase I - Summer (2)

Contact departmentfor a description of this course.

## MS 299-Special Studies (1-4)

(Credits to be arranged.)

MS 309 - Introduction to American Military History (3)
Covers the American Army's history fromits birth in 1775 to the eve of World WarI.

## MS 310 - American Military History (3)

The course builds on the introduction to American Military His tory covering World War Ito the Global War on Terror. Recommended prerequisiteMS 309

## MS 311 - Military Leadership (3)

This course studies Army Command and Control along with small unit leadership fundamentals. The Junior Officer's role and responsibilities in the leadership process are fully examined.

## MS 312-Military Operations (3)

The course studies the principles of war and the employment of military forces in accordance with U.S. Army doctrine, organization, equipment, and training.

## MS 313-Small-Unit Tactics (3)

The coursestudies the fundamentals, techniques, and procedures of light infantry squad and platoon tactics. Develops leadership skills in planning, organizing, and conducting small unit operations.

## MS 314 - Advanced Summer Program (0)

Contact department for a description of this course.

## MS 321 - Advanced LeadershipLab (1)

Contact department for a description of this course.

## MS 322 - Advanced LeadershipLab (1)

Contact department for a description of this course.

MS 323 - Leadership Lab (1)
Contact department for a description of this course.

## MS 331 -Advanced Physical Fitness (1)

Contact departmentfor a description of this course.

## MS 332 - Advanced Physical Fitness (1)

Contact departmentfor a description of this course.

## MS 333 - Advanced Physical Fitness (1)

Contact departmentfor a description of this course.

## MS 399 -Special Studies (1-4)

(Credits to be arranged.)

## MS 405 - Reading and Conference (1-6)

(Credits to be arranged.)

## MS 406 -Special Problems Special Projects (1-4)

(Credits to be arranged.)

## MS 409 -Practical FieldExperiences (1-6)

This course covers the summer practical experiences at either at the Leadership Training Course(LTC) or Leadership Development and Assessment Course (LDAC).

## MS 411 - Army Training Management (4)

The coursestudies both the Army's training philosophy and it's training system. The class focuses on the Junior Officer's role and responsibilities in the process of battle planning, establishment of unit training programs, and execution of military instruction.

## MS 412 -Military Law and Administration (4)

The course focuses on Military Justice, Army Personnel Management, and Army Logistics and Supply. Students study the Junior Officer's role and responsibilities in military law enforcement, officer and enlis ted personnel management, res ource management, and service and support.

## MS 413 -Pers onal Affairs and Career Development (3)

An in-depth examination of the SecondLieutenant on the Total Army and preparation for officer commis sioning in the Army National Guard, Reserves or Active Duty. This
course will help provide students with the critical information on various topics such as; officer specialty selection, unit assignments, promotion and mobilization, career planning and professional development.

## MS 421 - Advanced LeadershipLab (1)

Contact department for a description of this course.

MS 422 - Advanced LeadershipLab (1)
Contact department for a description of this course.

MS 423 - Advanced LeadershipLab (1)
Contact department for a description of this course.

## MS 431 - Advanced Physical Fitness (1)

Contact department for a description of this course.

## MS 432 - Advanced Physical Fitness (1)

Contact department for a description of this course.

## MS 433 - Advanced Physical Fitness (1)

Contact department for a description of this course.

## MS 499 -Special Studies (1-4)

(Credits to be arranged.)

MTax - Taxation
MTax 502 - Independent Study (1-12)
(Credit to be arranged.)

## MTax 510 -SelectedTopics (1-6)

(Credit to be arranged.)

## MTax 525-Tax Research and Writing (4)

Tax research methods applicable to and written communication forms common in professional tax practice; use of professional online tax research tools; legal and professional rules governing taxpractitioners.

## MTax 526-Tax Accounting Methods and Periods (4)

Determination of taxable year; assignment of items of gross income, deduction and credit to the proper taxable year, including coverage of cash, accrual, and installment methods of accounting; changing of taxable year and accounting method; interest, below-market interest, and original issue discount; claimof right and tax benefit rules.

## MTax 527 - Corporate Taxation I (4)

Taxation of corporateoperations, including 1551 and 1561; transactions between corporations and their shareholders, including transfers to corporations, dividends and other nonliquidating dis tributions; corporate liquidations.

## MTax 528 - Corporate Taxation II (4)

Continuation of MTax 527, including S corps; judicial doctrines such as substance over form, business purpose, step transactions and 7701(o); corporate reorganizations, acquisitions, divisions and liquidations of subsidiary corporations; carryover of taxattributes; consolidated returns; alternative minimum tax; penalty taxes and antiabuse provisions.

Prerequisite: MTax527.

## MTax 529 -Federal Tax Procedure (2)

Reporting requirements; audits; appeals function; as sessment procedures; tax litigation, particularly in the U.S. Tax Court; collections and spousal relief; penalties.

Prerequisite: Admission to the Master of Taxation or the Graduate Certificate in Taxation program.
MTax 530 - Taxation of Property Transactions (2)
The legal concept of property and income tax consequences resulting fromsales, exchanges, and other dis positions of property; determination of adjusted basis, depreciation deductions and other costrecovery methods; gain or loss realized and recognized on dis position; applicable taxrates; selected nonrecognition events.
Prerequisite: Required second course in program. Corequisite: Can be taken concurrently with MTax 525.

## MTax 531 - Pass-through Entities I(4)

Taxation of partnerships and other entities electing to be taxed underSubchapter K, such as LLCs; capitalization; determination of taxable income, allocation of taxitems; loss limitations; distributions; 754 elections; recourse and nonrecourse liabilities; disposition of interests; dis solution.

## MTax 532 - Pass-through Entities II (2)

Continuation of MTax531, including anti-abuse rules, self-employment tax, at-risk and passive loss limitations, "hot assets," transactions between owners and entity; distributions to retiring and deceased owners.
Prerequisite: MTax531.

## MTax 533 - Financial Accounting for Income Taxes (4)

Financial accounting and reporting standards for the effects of income taxes from corporate activities according to ASC740, including computation of tax expense or benefit, temporary differences, computation of deferred tax as sets and liabilities, valuation allowances, presentation and disclosure, and accounting for uncertainty, and other topics.
Prerequisite: MTax527.

## MTax 535 - State and Local Taxation (4)

Overview of taxes imposed at state and local level; taxes imposed on corporations and pass-through entities, conformity to the Internal Revenue Code, methods of reporting; allocation and apportionment; nexus; sales and use taxes; business and nonbusiness income; property taxes; exemptions; taxcredits and incentives.

## MTax 536 - International Taxation (4)

Introduction to U.S. taxation of U.S. firms, citizens, and residents with foreign source income, and U.S. taxation of foreign firms and individuals doing business within the United States.

## MTax 537 - Tax Case Capstone (3)

Provides students with an opportunity to work on complex tax is sues. Students work in teams, coached by experienced tax professionals, to develop solutions which will be deliverable to a hypotheticalclient both in written memo and oral presentation format. Deliverables will be evaluated by a panel of judges.
Prerequisite:MTax528 and MTax532. Corequisite: MTax 528 and MTax 532.

## MTax 538 - Taxation of Real Estate Transactions (2)

Overview of participants and professional services often involved in reales tate transactions; basic sales structures, deeds, titles, fin ancing arrangements, closings; remedies and foreclosure; federal tax provisions applicable to both residential and commercial trans actions, including nonrecognition provisions; credits, such as low-income housing and rehabilitation credits.
Prerequisite: MTax530 and admis sion to the Master of Taxation or the Graduate Certificate in Taxation program.

## MTax 539-Taxation of Estates, Gifts, and Trusts (4)

Federalestate, gift and generation-skipping taxlaws; history and purposes; included assets; valuation; credits and deductions allowed; income taxation of trusts, estates and beneficiaries.

## MTax 540 -Practicum/Internship (4)

Tax internship or practicumin a public accounting firm or entity taxdepartment; provides opportunity to apply programcontent to real-world en vironments, gain appreciation of work expectations and demands, and relate field experiences to master's coursework.
Prerequisite: MTax527 and MTax531.

## MTax 544 -Professional Practices Seminar (2)

Provides students an in-depth look at the business of tax, the requirements of a successful tax career, and some niche tax practice opportunities through live and interactive access to leading regional taxprofessionals speaking about their careers and areas of expertise.

## Mth - Mathematical Sciences

## Mth 095 - Intermediate Algebra (4)

Topics include problem solving, linear equations, systems of equations, poly nomials and factoring techniques, rational expressions, radicals and exponents, quadratic equations. Credit for enrollment (eligibility) but not toward graduation; s atisfies no University or general education requirements.
Prerequisite: Completion of Mth 070 with a grade of C- or above within the last year, or passing the necessary level on the mathematics placement test within the last year (see the Math Department website at pdx.edu/math for additional information). .

## Mth 105 - Excursions in Mathematics (4)

Exploration of a variety of modern mathematicaltopics. Topics may include the mathematics of voting systems, graphs and net works, symmetry in art and nature, population growth, fractals, probability. Intended for students without a strong algebra/calculus background, but with a desire to explore some interesting mathematics.
Prerequisite: Completion of Mth 95 with a grade of C- or above within the last year, or passing at the necessary level on the mathematics placement test within the last year (see Math Department webpage at mth.pdx.edu for information). .

## Mth 111 - Introductory College Mathematics I (4)

Introduction to functions, basic properties, graphs and inverse functions. Study of polynomial, rational, exponential, and logarithmic functions. This is the first course in a sequence of two: Mth 111 and Mth 112, which must be taken in sequence.
Prerequisite: Completion of Mth 095 with a grade of C- or above within the last year, or passing at the necessary level on the mathematics placement test within the last year (https://www.pdx.edu/math/placement).

## Mth 112 - Introductory College Mathematics II (4)

Introduction to trigonometric functions, basic properties, graphs, and inverse functions. Includes introduction to vectors, parametric equations, and polar coordinates. This is the second course in a sequence of two: Mth 111 and Mth 112, which must be taken in sequence.
Prerequisite: Completion of Mth 111 with a grade of C- or above within the last year, or passing at the necessary level on the mathematics placement test within the last year (https://www.pdx.edu/math/placement).

## Mth 191 - Mathematics Tutoring (3)

Training in one-to-one and small-group tutoring over a wide range of mathematical topics. Mth 191: tutoring in arithmetic and other non-university courses. Mth 192: tutoring in freshman-level mathematics. Mth 193: tutoring in sophomore junior- and senior-level mathematics. Required field work consists of providing tutoring service in the community or University. This is the first course in a sequence of three: Mth 191, Mth 192, and Mth 193. Recommended prerequisite: consent of instructor.

## Mth 192-Mathematics Tutoring (3)

Training in one-to-one and small-group tutoring over a wide range of mathematical topics. Mth 191: tutoring in arithmetic and other non-university courses. Mth 192: tutoring in freshman-level mathematics. Mth 193:tutoring in sophomore junior- and senior-level mathematics. Required field work cons ists of providing tutoring service in the community or University. This is the second course in a sequence of three: Mth 191, Mth 192, and Mth 193. Recommended prerequisite: consent of instructor.

## Mth 193-Mathematics Tutoring (3)

Training in one-to-one and small-group tutoring over a wide range of mathematical topics. Mth 191: tutoring in arithmetic and other non-university courses. Mth 192: tutoring in freshman-level mathematics. Mth 193: tutoring in sophomore junior- and senior-level mathematics. Required field work cons ists of providing tutoring service in the community or University. This is the third course in
a sequence of three: Mth 191, Mth 192, and Mth 193.
Recommended prerequisite: consent of instructor.

## Mth 199 -Special Studies (1-4)

(Credit to be arranged.)

## Mth 211 - Foundations Of Elementary Mathematics I

 (4)A constructivist approach to fundamental ideas of mathematics for prospective K-8 teachers. Topics include numeration, operations, number theory, and problem solving. This is the first course in a sequence of three: Mth 211, Mth 212, and Mth 213.

Prerequisite: Completion of Mth 95 with a grade of C- or above within the last year, or passing at the necessary level on the mathematics placement test within the lastyear (see Math Department webpage at mth.pdx.edu for information). .

## Mth 212 - Foundations Of Elementary Mathematics II

 (4)A constructivist approach tofundamental ideas of mathematics for prospective K-8 teachers. Topics include rational numbers, probability, and statistics. This is the second course in a sequence of three: Mth211, Mth 212, and Mth 213.
Prerequisite: Mth211..
Mth 213 - Foundations Of Elementary Mathematics III (4)

A constructivist approach to fundamental ideas of mathematics for pros pective K-8 teachers. Topics include algebra, geometry, and measurement. This is the third course in a sequenceof three: Mth 211, Mth 212, and Mth 213.

Prerequisite: Mth 211..

## Mth 231 - Data Science Seminar (2)

Introduction to data science presented in the formof lectures by the instructor as well as guest lectures from local industry experts illustrating the potential of data science in terms of success stories in various application areas of science, engineering, medicine and finance. The presented examples will describe the kind of mathematical, statistical, and computer science skills needed for a data scientist to be successful in their future career.

Prerequisite: Completion of Mth 111 with a grade of C- or above within the last year, or passing at the necessary level on the mathematics placement test within the lastyear (https://www.pdx.edu/math/placement).

## Mth 251 - Calculus I (4)

Differential calculus of functions of a single variable, including limits, the definition and computation of the derivative, and applications of the derivative. This is the first course in a sequence of three: Mth 251, Mth 252, and Mth 253, which must be taken in sequence.

Prerequisite: Completion of Mth 112 with a grade of C- or above within the last year, or passing at the necessary level on the mathematics placement test within the last year (see Math Department webpage at mth.pdx.edu for information).

Mth 251R-Recitation Mth 251 (0)
Recitation forMth 251.

## Mth 252-Calculus II (4)

Integral calculus of functions of a single variable, including the FundamentalTheoremof Calculus, numerical integration and applications. This is the second course in a sequence of three: Mth 251, Mth 252, and Mth 253, which must be taken in sequence.
Prerequisite: Mth 251.

## Mth 253 - Calculus III (4)

Introduction to differential equations, infinite series, parametric equations, polar coordinates, and conic sections. This is the third course in a sequence of three: Mth 251, Mth 252, and Mth 253, which must be taken in sequence.

Prerequisite: Mth 252.
Mth 254 - Calculus IV (4)
An introduction to differential and integral calculus of functions of several variables, including vector geometry, the calculus of vector valued functions, and applications.
Prerequisite: Mth 253 or (Mth 252 and Mth 261).
Mth 255-Calculus V (4)
Further study of multiple integrals, line and surface integrals, Green's theorem, Stokes' theorem, the divergence theorem, and applications.
Prerequisite: Mth 254.

## Mth 256 - Applied Ordinary Differential Equations (4)

Solution techniques in ordinary differential equations; applications.
Prerequisite: Mth 252, Mth 261.
Mth 261 - Introduction to Linear Algebra (4)
Systems of linear equations, linear transformations, matrix algebra, vector spaces, and determinants.

Prerequisite: Mth 251.
Mth 261R - Recitation for Mth 261 (0)
Recitation forMth 261.

## Mth 271-Mathematical Computing (4)

Machine representation of the real number field and its consequences. Elements of error analysis. Introduction to the design, analysis, and stability of algorithms. Well/illconditioned problems. Programming, graphics, numeric and symbolic computations in MATLAB (a high level programming environment). Examples and applications in mathematics, science, and engineering.
Prerequisite: Mth 253, Mth 261.
Mth 299-Special Studies (1-4)
(Credit to be arranged.)

## Mth 300 - Introduction to Mathematical Reasoning (4)

Fundamental abstractconcepts common to all branches of mathematics, including first order predicate calculus, sets and functions, and elements from group theory and the foundations of analysis. Special emphasis is placed on the ability to understand and construct rigorous proofs.

Prerequisite: Mth 253, Mth 261.
Mth 311 - Introduction to Mathematical Analysis I (4)
A rigorous treatment of the concepts of analysis. Properties of the real numbers. Sequences. Functions of a real variable: limits, continuity, and differentiability. This is the first course in a sequence of two: Mth 311, Mth 312 and must be taken in sequence.
Prerequisite: Mth 253.
Mth 312 - Introduction to Mathematical Analysis II (4)
A rigorous treatment of the concepts of analysis. Integration on the real line. Series of real numbers. Series of functions. Uniformconvergence. Powerseries. This is the second course in a sequence of two: Mth 311, Mth 312 and must be taken in sequence.
Prerequisite: Mth 311.
Mth 313 - Advanced Multivariate Calculus (4)
Differential and integral calculus of functions of several variables, the inverse and implicit function theorems, vector field theory, line and surface integrals, Green's, Stokes', and Gauss' theorems.
Prerequisite: Mth 254 and Mth 312.

Mth 322 - Applied Partial Differential Equations (4)
Introduction to equations of mathematical physics, in particular, linear and nonlinear ad vection equation, wave equation, initial and boundary value problems, method of characteristics, separation of variables.
Prerequisite: Mth 256.
Mth 324 -Vector Analysis (4)
Modern vector methods with applications forstudents of mathematics, physics, and engineering.
Prerequisite: Mth 254.
Mth 338 - Modern College Geometry (4)
Topics in Euclidean and non-Euclidean geometry.
Prerequisite: Mth 252, Mth 261 .
Mth 343 - Applied Linear Algebra (4)
Topics in matrix algebra, determinants, systems of linear equations, eigenvalues, eigenvectors, and linear transformations. Selected applications fromscience, engineering, computer science, and business.

Prerequisite: Mth 252, Mth 261.
Mth 344 - Introduction to Group Theory and Applications (4)
Groups, homomorphisms, factor groups. Selected applications fromgeometry, combinatorics, computer science, chemistry.
Prerequisite: Mth 252, Mth 261.
Mth 345 - Introduction to Ring and Field Theory (4)
Topics in rings, integral domains, fields, ordered fields, polynomial rings. The development of the real number system.
Prerequisite: Mth 344.
Mth 346 - Number Theory (4)
A presentation of the properties of numbers as found in the theory of divisibility, congruence, diophantine equations, continued fractions, and algebraic numbers.
Prerequisite: Mth 252, Mth 261.

## Mth 356 -Discrete Mathematics (4)

Topics in discrete mathematics, including propositional logic, sets, relations, inverse functions, divisibility, induction, recurrences, inclusion-exclusion, permutations, combinations, graphs, graph coloring, and applications. Expected preparation: MTH 261.
Prerequisite: Mth 253.

## Mth 371 - Large-Scale Data Algorithms (4)

Relations, graphs and sparse matrices as tools for representing large-scale data. Graph Laplacian and modularity matrices. Spectralclustering, weighted graph matching, and modularity optimization. Gradient descent methods accelerated by coarse models for solving largescale systems of equations.

Prerequisite: Mth 343 and (Mth 271 or CS 161).
Mth 399-Special Studies (1-6)
(Credit to be arranged.)

Mth 399U-Special Studies (4)
(Credit to be arranged.)

## Mth 401 - Research(1-6)

(Credit to be arranged.) Consent of instructor.

Mth 402-(1-12)

Mth 404 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

## Mth 405 - Reading and Conference (1-6)

(Credit to be arranged.) Consent of ins tructor.

Mth 407-Seminar (1-6)
(Credit to be arranged.) Consent of instructor.

## Mth 410 -SelectedTopics (1-6)

(Credit to be arranged.) Consent of instructor.

## Mth 411 - Introduction to Real Analysis I (3)

Analysis on metric spaces, Baire Category, Contraction Mapping, and Stone-Weierstrass theorems. This is the first course in a sequence of three: Mth 411, Mth 412 and Mth 413 which must be taken in sequence.
Also offered for graduate-level credit as Mth 511 and may be taken only once forcredit. . Prerequisite: Mth 312 .

## Mth 412 - Introduction to Real Analysis II (3)

Lebesgue meas ure and integration theory, functions of bounded variation, absolutely continuous functions. This is
the second course in a sequence of three: Mth 411, Mth 412 and Mth 413 which must be taken in sequence.

Als o offered for graduate-level credit as Mth 512 and may be taken only once for credit. . Prerequisite: Mth 411.
Mth 413 - Introduction to Real Analysis III (3)
Banach and Hilbert spaces, bases and duality in Hilbert spaces, linear operators on Banach spaces, introduction to Fourier series. This is the third course in a sequence of three: Mth 411, Mth 412 and Mth 413 which must be taken in sequence.

Als o offered for graduate-level credit as Mth 513 and may be taken only once for credit. . Prerequisite: Mth 412.
Mth 420 - Introduction to Complexity Theory (3)
An introduction to theoretical computer science. Includes a study of models of computation, complexity classes, Cook's theorem, polynomial and nonpolynomial classes, discrete problems.
Prerequisite: Mth 344.
Mth 421 - Theory of Ordinary Differential Equations I (3)

Vector fields and phase flows in the plane. Linear systems. Existence, uniqueness, and continuity theorems for systems. Additional topics. This is the first course in a sequence of three: Mth 421, Mth 422, and Mth 423 which must be taken in sequence.
Also offered for graduate-level credit as Mth 521 and may be taken only once for credit. . Prerequisite: Mth 256 and Mth 312.

## Mth 422 - Theory of Ordinary Differential Equations II

 (3)Nonlinear sy stems. Equilibria and local stability. Gradient and Hamiltonian systems. Poincare maps and limit sets. Applications and additional topics. This is the second course in a sequence of three: Mth 421, Mth 422, and Mth 423 which must be taken in sequence.

Also offered for graduate-level credit as Mth 522 and may be taken only once for credit. . Prerequisite: Mth 421.

Mth 423 - Theory of Ordinary Differential Equations III (3)

The two-body problem. The Lorenz system. Homoclinic bifurcations. Chaotic attractors. Hors eshoes. Symbolic dynamics and the shift map. Discretedynamics. Additional topics. This is the third course in a sequence of three: Mth 421, Mth 422, and Mth 423 which must be taken in sequence.

Als o offered for graduate-level credit as Mth 523 and may be taken only once for credit. . Prerequisite: Mth 422.

## Mth 424-Eementary Differential Geometry I (3)

Differential geometry of curves and surfaces: parametrizations, global properties of curves, surfaces of dimension three, examples, first and second fundamental form, curvature, geodesics. This is the first course in a sequence of two: Mth 424 and Mth 425 which must be taken in sequence.

Also offered for graduate-level credit as Mth 524 and may be taken only once for credit. .Prerequisite: Either Mth 421 or both Mth 254 and Mth 256.

## Mth 425 -Elementary Differential Geometry II (3)

Surfaces of constant curvature, the Gauss-Bonnet theorem; spherical and hyperbolic geometry, elementary Riemannian geometry applications frommechanics and field theory. This is the second course in a sequenceof two: Mth 424 and Mth 425 which must be taken in sequence.
Also offered for graduate-level credit as Mth 525 and may be taken only once forcredit. . Prerequisite: Mth 424.

## Mth 427 - Partial Differential Equations I (3)

Solution techniques, qualitative analy sis and applications: separation of variables, eigenfunction expansion, Fourier series solutions, Sturm-Liouville problems. This is the first course in a sequenceof two: Mth 427 and Mth 428 which must be taken in sequence. Prior knowledge of PDEs (Mth 322) is recommended, but not required.

Also offered for graduate-level credit as Mth 527 and may be taken only once forcredit. .Prerequisite: Mth 256, Mth 253, Mth 254.

## Mth 428 - Partial Differential Equations II (3)

Higher dimensional equations, heat conduction in a disk, vibrating membrane, spherical problems, Bes sel and Legendre functions, Green's functions, Fredholm alternative. Infinite domain problems, Fourier transform solutions, finite difference methods. This is the second course in a sequenceof two: Mth 427 and Mth 428 which must be taken in sequence.
Also offered for graduate-level credit as Mth 528 and may be taken only once forcredit. . Prerequisite: Mth 427.

## Mth 430 - Topics in Mathematical Modeling (3)

Basic introduction to mathematical modelbuilding starting with prototype, model purpose definition, and model validation. Models will be chosen fromlife, the physical and social sciences. Applications chosen fromdifferential equations, linear programming, group theory, probability or other fields. With approval, this course may be repeated for credit.

Also offered for graduate-level credit as Mth 530. . Prerequisite: Consent of instructor and either Mth 256 or Mth 421/Mth 521.

## Mth 431 - Topics in Geometry I (3)

Topics selected fromprojective geometry, non-Euclidean geometry, algebraic geometry, convexity, differential geometry, foundations of geometry, combinatorial topology. This is the first course in a sequence of three: Mth 431, Mth 432, and Mth 433; with departmental approval, this sequence may be repeated for credit.

Also offered for graduate-level credit as Mth 531. .
Prerequisite: Mth 311, Mth 338, or Mth 344.

## Mth 432 - Topics in Geometry II (3)

Topics selected fromprojective geometry, non-Euclidean geometry, algebraic geometry, convexity, differential geometry, foundations of geometry, combinatorial topology. This is the second course in a sequence of three: Mth 431, Mth 432, and Mth 433; with departmental approval, this sequence may be repeated for credit.
Also offered for graduate-level credit as Mth 532. . Prerequisite: Mth 311, Mth 338, or Mth 344.

## Mth 433 - Topics in Geometry III (3)

Topics selected fromprojective geometry, non-Euclidean geometry, algebraic geometry, convexity, differential geometry, foundations of geometry, combinatorial topology. This is the third course in a sequence of three: Mth 431, Mth 432, and Mth 433; with departmental approval, this sequence may be repeated for credit.
Also offered for graduate-level credit as Mth 533. .
Prerequisite: Mth 311, Mth 338, or Mth 344.
Mth 434 -Set Theory and Topology I (3)
DeMorgan's Laws, partially ordered and well-ordered sets, Cardinaland ordinal numbers. The axiom of choice and equivalent formulations. Additional topics. This is the first course in a sequence of three: Mth 434, Mth 435, and Mth 436 which must be taken in sequence.
Als o offered for graduate-level credit as Mth 534 and may be taken only once for credit. . Prerequisite: Mth 311.

## Mth 435 -Set Theory and Topology II (3)

Introduction to general topology with the notions of interior, closure, topological space, continuity, and homeomorphism. Construction techniques and properties of point-set topology, es pecially connectedness, compactness, and separation. This is the second course in a sequence of three: Mth 434, Mth 435, and Mth 436 which must be taken in sequence.
Also offered for graduate-level credit as Mth 535 and may be taken only once for credit. . Prerequisite: Mth 434.

## Mth 436-Set Theory and Topology III (3)

Covering spaces, fundamental group. Additional topics. This is the third course in a sequence of three: Mth 434, Mth 435, and Mth 436 which must be taken in sequence.

Also offered for graduate-level credit as Mth 536 and may be taken only once forcredit. . Prerequisite: Mth 435.

## Mth 441 - Introduction to Abs tract AlgebraI (3)

Group theory and homomorphismtheorems. This is the first course in a sequenceof three: Mth 441, Mth 442, and Mth 443 which must be taken in sequence.

Also offered for graduate-level credit as Mth 541 and may be taken only once for credit. . Prerequisite: Mth 344.

## Mth 442 - Introduction to Abstract Algebra II (3)

The theory of rings, modules, and fields. This is the second course in a sequenceof three: Mth 441, Mth 442, and Mth 443 which must be taken in sequence.
Also offered for graduate-level credit as Mth 542 and may be taken only once forcredit. . Prerequisite: Mth 441.

## Mth 443 - Introduction to Abstract Algebra III (3)

Topics may include: advanced theory of groups, rings, and fields, as well as linear algebra or Galois theory. This is the third course in a sequence of three: Mth 441, Mth 442, and Mth 443 which must be taken in sequence.

Also offered for graduate-level credit as Mth 543 and may be taken only once for credit. . Prerequisite: Mth 442.

## Mth 444 - Advanced Linear/Multilinear Algebra I (3)

Vector spaces, linear transformations, matrices, products, quotients, and duals of vector spaces. Minimal and characteristic polynomials, canonical forms. This is the first course in a sequence of two: Mth 444 and Mth 445 which must be taken in sequence.

Also offered for graduate-level credit as Mth 544. Prerequisite: Mth 344.

## Mth 445 - Advanced Linear/Multilinear Algebra II (3)

Multilinear maps, tensor products, exterior algebra. Finite dimens ional spectral theory. This is the second course in a sequence of two: Mth 444 and Mth 445 which must be taken in sequence.
Also offered for graduate-level credit as Mth 545 and may be taken only once for credit. Prerequis ite: Mth 444.

## Mth 449 - Topics in Advanced Number Theory (3)

A study of advanced topics selected fromthe areas of algebraic or analytic theory. With departmental approval, this course may be repeated for credit.

Also offered for graduate-level credit as Mth 549 and may be taken only once for credit. . Prerequisite: Mth 346.

Mth 451 - Numerical Calculus I(3)
Computer arithmetic. Solution of nonlinear equations. Interpolation. Numerical integration and differentiation. Solution of linear equation systems. Eigenvalue problem,
least square, Chebyshev, trigonometric and rational function approximation. Numerical solution of differential equations. This is the first course in a sequence of three: Mth 451, Mth 452, and Mth 453 which must be taken in sequence.
Also offered for graduate-level credit as Mth 551 and may be taken only once for credit. . Prerequisite: knowledge of a programming language such as MATLAB or $\mathrm{C} / \mathrm{C}++$, Mth 253 and Mth 261.

## Mth 452 - Numerical Calculus II (3)

Computer arithmetic. Solution of nonlinear equations. Interpolation. Numerical integration and differentiation. Solution of linearequation systems. Eigenvalue problem, least square, Chebyshev, trigonometric and rational function approximation. Numerical solution of differential equations. This is the second course in a sequence of three: Mth 451, Mth 452, and Mth 453 which must be taken in sequence.

Also offered for graduate-level credit as Mth 552 and may be taken only once for credit. . Prerequisite: knowledge of a programming language such as MATLAB or $\mathrm{C} / \mathrm{C}++$, Mth 253 and Mth 261.

## Mth 453 - Numerical Calculus III (3)

Computer arithmetic. Solution of nonlinear equations. Interpolation. Numerical integration and differentiation. Solution of linearequation systems. Eigenvalue problem, least square, Chebyshev, trigonometric and rational function approximation. Numerical solution of differential equations. This is the third course in a sequence of three: Mth 451, Mth 452, and Mth 453 which must be taken in sequence.

Also offered for graduate-level credit as Mth 553 and may be taken only once for credit. . Prerequisite: knowledge of a programming language such as MATLAB or $\mathrm{C} / \mathrm{C}++$, Mth 253 and Mth 261.

## Mth 456 - Topics in Combinatorics (3)

Selected topics from: permutations, combinations, partitions, generating functions, inclusion/exclusion, recursion, Polyacounting, block designs, orthogonal polynomials, and error-correcting codes. With departmental approval may be repeated for credit.
Also offered for graduate-level credit as Mth 556.
Prerequisite: Mth 356 or CS 251.
Mth 457 - The Mathematical Theory of Games I (3)
Introduction to mathematical game theory and game theoretic analysis. Topics include: combinatorial and strategic games, Perfect Competition, Zermelo's Algorithm, Payoffs, cooperative and non-cooperative games, bargaining, mixed strategies, and Nash Equilibria, Selected applications to economics, biology, computer science, and political science. This is the first course in a
sequence of two: Mth 457 and Mth 458 which must be taken in sequence.
Also offered for graduate-level credit as Mth 557 and may be taken only once for credit. . Prerequisite: Mth 261 and/orStat 243.

Mth 458 - The Mathematical Theory of Games II (3)
Introduction to mathematical game theory and game theoretic analysis. Topics include: Dilemma, search, and differential games. Repeated games and finite automata. Common knowledge, complete and incomplete information, behavioral and evolutionary stable strategies, as sessment equilibria. Selected applications to economics, biology, computer science, and political science. This is the second course in a sequenceof two: Mth 457 and Mth 458 which must be taken in sequence.

Also offered for graduate-level credit as Mth 558 and may be taken only once forcredit. . Prerequisite: Mth 457.

## Mth 461 - Graph Theory I (3)

Topics in graph theory, including connectivity, matchings, graph algorithms, network flows, isomorphisms, Eulerian graphs, spanning trees, decompositions, shortest paths, colorings of graphs, and selected applications. This is the first course in a sequence of two: Mth 461 and Mth 462 which must be taken in sequence.
Also offered for graduate-level credit as Mth 561 and may be taken only once forcredit. .Prerequisite: Mth 261, Mth 356.

## Mth 462 - Graph Theory II (3)

Topics in graph theory, including graph matrices, Hamiltonian graphs, the matrix-tree theorem, planarity and embeddings, Kuratowski's theorem, matroids, and selected applications. This is the second course in a sequence of two: Mth 461 and Mth 462 which must be taken in sequence.
Also offered for graduate-level credit as Mth 562 and may be taken only once forcredit. . Prerequisite: Mth 461.

## Mth 464 - Numerical Optimization I (3)

Fundamentals of unconstrained optimization, necessary and sufficient conditions, overview of numerical algorithms, rate of convergence, line search and trustregion methods. Gradient descent, conjugate gradient, Newton and quasi-Newton methods, nonlinear leastsquares problems, Gauss-Newton and LevenbergMarquardt methods, practical applications. This is the first course in a sequence of two: Mth 464 and Mth 465. Expected preparation: knowledge of a high-level programming language such as MATLAB, Python, R, or C/C++.

Also offered for graduate-level credit as Mth 564 and may be taken only once for credit. Prerequisite: Mth 254 and Mth 261.

## Mth 465 - Numerical Optimization II (3)

Theory of constrained optimization, equality and inequality constraints, Lagrange multipliers, Karush-Kuhn-Tucker (KKT) optimality conditions, penalty methods, quadratic and sequential quadratic programming, applications. This is the second course in a sequence of two: Mth 464/564 and Mth $465 / 565$ which must be taken in sequence.

Also offered for graduate-level credit as Mth 565 and may be taken only oncefor credit. Prerequisite: Mth 464.

## Mth 470 - Complex Analysis and Boundary Value Problems I (3)

Fundamental concepts of complexanalysis. Cauchy's theorem. Analytic functions. Power and Laurent series. Residue Theorem. This is the first course in a sequence of three: Mth 470, Mth 471, and Mth 472 which must be taken in sequence.

Als o offered for graduate-level credit as Mth 570 and may be taken only once for credit. . Prerequisite: Mth 254 and either Mth 256 or Mth 421.

## Mth 471 - Complex Analysis and Boundary Value Problems II (3)

Fundamental concepts of complexanalysis. Calculus of residues and applications. Conformal mappings. Zero-Pole theorem. Infinite products. This is the second course in a sequence of three: Mth 470 , Mth 471 , and Mth 472 . which must be taken in sequence.
Also offered for graduate-level credit as Mth 571 and may be taken only once for credit. . Prerequisite: Mth 470.

## Mth 472 - Complex Analysis and Boundary Value Problems III (3)

Partial differential equations and boundary value problems using Fourier series. This is the third course in a sequence of three: Mth 470, Mth 471, and Mth 472 which must be taken in sequence.
Also offered for graduate-level credit as Mth 572 and may be taken only once for credit. . Prerequisite: Mth 471.

## Mth 477 - Mathematical Control Theory I (3)

Mathematical foundations of linear time invariant control systems. Controllability, observability, stabilizability, feedback. Applications. This is the first course in a sequence of two: Mth 477 and Mth 478 , which must be taken in sequence. Expected preparation: Mth 253, Mth 254.

Also offered for graduate-level credit as Mth 577 and may be taken only once for credit. . Prerequisite: Mth 256 .

## Mth 478-Mathematical Control Theory II (3)

Elements of the calculus of variations and optimal control. Dynamic programming. Pontry agin maximum principle. Applications. This is the second course in a sequence of two: Mth 477 and Mth 478 which must be taken in sequence.

Also offered for graduate-level credit as Mth 578 and may be taken only once forcredit. . Prerequisite: Mth 477.

## Mth 481 - Topics in Probability for Mathematics Teachers (3)

Selected topics in probability for mathematics teachers. Topics may include origins and development of probability theory, counting theory, laws of probability, conditional probability, independence, odds, standard discrete and continuous probability distributions, expected values, moment generating functions, and numerous computer simulations. With departmental approval may be repeated for credit.

Also offered for graduate-level credit as Mth 581. Prerequisite: Stat 244 and two upper-division courses approved for math major credit or Stat 452 or Stat 462.
Mth 482 - Topics in Statistics for Mathematics Teachers (3)
Selected topics in statistics for mathematics teachers. Potential topics include descriptive statistics (measures of center, variability, skewness, etc.), inferential statistics (one and two population problems), CentralLimit Theorem, modeling and simulation techniques, and research design techniques. With departmental approval may be repeated forcredit.
Also offered for graduate-level credit as Mth 582. Prerequisite: Stat 244 and two upper-division courses approved for math major credit or Stat 452 or Stat 462.

## Mth 483 - Topics in Geometry for Mathematics

 Teachers (3)Selected topics in geometry for mathematics teachers. Potential topics includeinductive and deductive reasoning, analytic and metric geometry, is ometry and symmetry, and hyperbolic, spherical and/or taxicab geometry. With departmental approval may be repeated for credit.

Also offered for graduate-level credit as Mth 583. Prerequisite: Mth 338.
Mth 484 - Topics in Algebra for Mathematics Teachers (3)

Selected topics in algebra for mathematics teachers. Potential topics may include algebraic structures (groups, rings, fields, vector spaces), equivalence, function, operation, well-defined-ness, equation solving, algorithms, and proving using geometric, symbolic, and verbal
representation systems. With departmentalapproval may be repeated for credit.

Also offered for graduate-level credit as Mth 584.
Prerequisite: Mth 344.

## Mth 485 - Topics in Analysis for Mathematics Teachers

 (3)Selected topics in analy sis for mathematics teachers. Potential topics includefunctions, limits, continuity, derivatives, integration, completeness, covariation, sequences and series, differential equations, complex analys is, and topology. With departmental approval may be repeated for credit.
Also offered for graduate-level credit as Mth 585. Prerequisite: Mth 311.

## Mth 486 - Topics in The History of Mathematics (3)

Selected topics in the historical development of mathematics. With departmental approval, this course may be repeated for credit.
Also offered for graduate-level credit as Mth 586. Prerequisite: at least two upper-division courses approved for major credit.

## Mth 487 - Topics in Discrete Mathematics for Mathematics Teachers (3)

Selected topics in discrete mathematics for teachers. Potential topics include set theory, logic, elementary probability theory, relations, recursions, algorithms, counting theory, permutations, financemathematics, combinations, graph theory, algorithms, logic, and number theory. With departmental approval may be repeated for credit.

Also offered for graduate-level credit as Mth 587. Prerequisite: Mth 356.

## Mth 488-Topics in Computing for Mathematics Teachers (3)

Selected topics and tools for mathematical computing for mathematics teachers. As an example, a simple but powerfulset of programming and graphical tools in ' C ' may be introduced and used to explore a wide range of mathematical topics including statistics, probability, trigonometry, analytic geometry, calculus and modeling. With departmental approval may be repeated forcredit.

Also offered for graduate-level credit as Mth 588.
Prerequisite: (Mth 271 or CS 161) and Mth 344.

## Mth 491 - Experimental Probability and Statistics for Middle School Teachers (4)

A study of probability and statistics through laboratory experiments, simulations, and applications, with integration of problemsolving and technology. Not approved for major credit. Available for graduate credit
toward the graduatecertificate programin middle school mathematics.

Also offered for graduate-level credit as Mth 591 and may be taken only once for credit. .Prerequisite: Mth 112, Mth 212, Mth 213.

Mth 493 - Geometry for Middle School Teachers (4)
Selected topics frominformal geometry, both two- and three-dimensional, with integration of problem solving and technology. Not approved for major credit. Available for graduate credit toward the graduate certificate programin middle school mathematics.

Also offered for graduate-level credit as Mth 593 and may be taken only once for credit. .Prerequisite: Mth 112, Mth 212, Mth 213.

## Mth 494 - Arithmetic and Algebraic Structures for Middle School Teachers (4)

The study of the real number systemand its subsystems will lead to the introduction of more general algebraic structures and their applications, with focus on problem solving. Not approved for major credit. Available for graduate credit toward the graduate certificate programin middle school mathematics.

Also offered for graduate-level credit as Mth 594 and may be taken only once forcredit. .Prerequisite: Mth 112, Mth 212, Mth 213.

## Mth 495 - Historical Topics in Mathematics for Middle School Teachers (4)

A survey of the historical development of topics in mathematics fromancient to moderntimes, with special emphasis on topics in arithmetic, algebra and informal geometry, and with integration of problem solving and technology. Not approved for major credit. Available for graduate credit toward the graduate certificate programin middle school mathematics.
Also offered for graduate-level credit as Mth 595 and may be taken only once forcredit. .Prerequisite: Mth 112, Mth 212, Mth 213.

## Mth 496 - Concepts of Calculus for Middle School

 Teachers (4)An introduction to the limit concept and its role in defining the derivative, the integral and infinite series. Applications to middle school mathematics, with integration of problem solving and technology. Not approved for major credit.
Available for graduate credit toward the graduate certificate programin middle school mathematics.
Also offered for graduate-level credit as Mth 596 and may be taken only once forcredit. . Prerequisite: Mth 112, Mth 212, Mth 213.

## Mth 497 - Mathematics in the Middle School Classroom (4)

A survey of mathematics taught in the middle school grades, with focus on both content and pedagogical recommendations of the National Council of Teachers of Mathematics, and with integration of problemsolving and technology. Not approved for major credit. A vailable for graduate credit toward the graduate certificate programin mathematics for middle school teachers.
Also offered for graduate-level credit as Mth 597 and may be taken only once for credit. . Prerequisite: Mth 112, Mth 212, Mth 213.

## Mth 501 - Research (1-9)

(Credit to be arranged.) Consent of ins tructor.

Mth 503-Thesis (1-9)
(Credit to be arranged.)

## Mth 504 - Cooperative Education/Internship (1-9)

(Credit to be arranged.)

## Mth 505 - Reading and Conference (1-4)

(Credit to be arranged.) Consent of instructor.

## Mth 507 -Seminar (1-6)

(Credit to be arranged.) Consent of ins tructor.

## Mth 509 - Practicum(1-9)

(Credit to be arranged.)

## Mth 510 -SelectedTopics (1-6)

(Credit to be arranged.) Consent of ins tructor.

## Mth 511 - Introduction to Real Analysis I (3)

Analysis on metric spaces, Baire Category, Contraction Mapping, and Stone-Weierstrass theorems. This is the first course in a sequenceof three: Mth 511, Mth 512 and Mth 513 which must be taken in sequence.
Also offered for undergraduate-level credit as Mth 411 and may be taken only once for credit. . Prerequis ite: Mth 312.

## Mth 512 - Introduction to Real Analysis II (3)

Lebesgue meas ure and integration theory, functions of bounded variation, absolutely continuous functions. This is the second course in a sequence of three: Mth 511, Mth 512 and Mth 513 which must be taken in sequence.
Also offered for undergraduate-level credit as Mth 412 and may be taken only once for credit. . Prerequisite: Mth 511.
Mth 513 - Introduction to Real Analysis III (3)
Banach and Hilbert spaces, bases and duality in Hilbert spaces, linear operators on Banach spaces, introduction to Fourier series. This is the third course in a sequence of three: Mth 511, Mth 512 and Mth 513 which must be taken in sequence.
Also offered for undergraduate-levelcredit as Mth 413 and may be taken only once for credit. . Prerequis ite: Mth 512.

## Mth 521 - Theory of Ordinary Differential Equations I

 (3)Vector fields and phase flows in the plane. Linear systems. Existence, uniqueness, and continuity theorems for systems. Additional topics. This is the first course in a sequence of three: Mth 521 , Mth 522, and Mth 523 which must be taken in sequence.

Also offered for undergraduate-levelcredit as Mth 421 and may be taken only once for credit. . Prerequisite: Mth 256 and Mth 312.

Mth 522 - Theory of Ordinary Differential Equations II (3)

Nonlinear systems. Equilibria and local stability. Gradient and Hamiltonian systems. Poincare maps and limit sets. Applications and additional topics. This is the second course in a sequenceof three: Mth 521, Mth 522, and Mth 523 which must be taken in sequence.

Also offered for undergraduate-level credit as Mth 422 and may be taken only once for credit. . Prerequisite: Mth 521.

## Mth 523 - Theory of Ordinary Differential Equations III (3)

The two-body problem. The Lorenz system. Homoclinic bifurcations. Chaotic attractors. Horseshoes. Symbolic dynamics and the shift map. Discrete dynamics. Additional topics. This is the third course in a sequence of three: Mth 521 , Mth 522 , and Mth 523 which must be taken in sequence.
Also offered for undergraduate-level credit as Mth 423 and may be taken only once for credit. . Prerequisite: Mth 522.

Mth 524 -Elementary Differential Geometry I (3)
Differential geometry of curves and surfaces: parametrizations, global properties of curves, surfaces of dimension three, examples, first and second fundamental
form, curvature, geodesics. This is the first course in a sequence of two: Mth 524 and Mth 525 which must be taken in sequence.
Also offered for undergraduate-level credit as Mth 424 and may be taken only once for credit. . Prerequisite: Either Mth 521 or both Mth 254 and Mth 256.

## Mth 525 -Elementary Differential Geometry II (3)

Surfaces of constant curvature, the Gaus s-Bonnet theorem; spherical and hyperbolic geometry, elementary Riemannian geometry applications frommechanics and field theory. This is thesecond course in a sequenceof two: Mth 524 and Mth 525 which must be taken in sequence.
Also offered for undergraduate-level credit as Mth 425 and may be taken only once for credit. . Prerequis ite: Mth 524.

## Mth 527 - Partial Differential Equations I (3)

Solution techniques, qualitative analy sis and applications: separation of variables, eigenfunction expansion, Fourier series solutions, Sturm-Liouville problems. This is the first course in a sequence of two: Mth 527 and Mth 528 which must be taken in sequence. Prior knowledge of PDEs (Mth 322 ) is recommended, but not required.

Also offered for undergraduate-level credit as Mth 427 and may be taken only once for credit. . Prerequisite: Mth 256, Mth 253, Mth 254.

## Mth 528 - Partial Differential Equations II (3)

Higher dimens ional equations, heat conduction in a disk, vibrating membrane, spherical problems, Bes sel and Legendre functions, Green's functions, Fredholm alternative. Infinite domain problems, Fourier transform solutions, finite difference methods. This is thesecond course in a sequence of two: Mth 527 and Mth 528 which must be taken in sequence.
Also offered for undergraduate-level credit as Mth 428 and may be taken only once for credit. . Prerequisite: Mth 527.

## Mth 530 - Topics in Mathematical Modeling (3)

Basic introduction to mathematical modelbuilding starting with prototype, model purpose definition, and model validation. Models will be chosen fromlife, the physical and social sciences. Applications chosen fromdifferential equations, linear programming, group theory, probability or other fields. With approval, this course may be repeated for credit.

Also offered for undergraduate-level credit as Mth 430. . Prerequisite: Consent of instructor and either Mth 256 or Mth 421/Mth 521.
Mth 531 - Topics in Geometry I (3)
Topics selected fromprojective geometry, non-Euclidean geometry, algebraic geometry, convexity, differential
geometry, foundations of geometry, combinatorial topology. This is the first course in a sequenceof three: Mth 531, Mth 532, and Mth 533; with departmental approval, this sequence may be repeated forcredit.
Also offered for undergraduate-levecredit as Mth 431. Prerequisite: Mth 311, Mth 338, or Mth 344.

## Mth 532 - Topics in Geometry II (3)

Topics selected fromprojective geometry, non-Euclidean geometry, algebraic geometry, convexity, differential geometry, foundations of geometry, combinatorial topology. This is the second course in a sequence of three: Mth 531, Mth 532, and Mth 533; with departmental approval, this sequence may be repeated for credit.
Also offered for undergraduate-levelcredit as Mth 432. . Prerequisite: Mth 311, Mth 338, or Mth 344.

## Mth 533 - Topics in Geometry III (3)

Topics selected fromprojective geometry, non-Euclidean geometry, algebraic geometry, convexity, differential geometry, foundations of geometry, combinatorial topology. This is the third course in a sequence of three: Mth 531, Mth 532, and Mth 533; with departmental approval, this sequence may be repeated for credit.
Also offered for undergraduate-levecredit as Mth 433. . Prerequisite: Mth 311, Mth 338, or Mth 344.
Mth 534 - Set Theory and Topology I (3)
DeMorgan's Laws, partially ordered and well-ordered sets, Cardinal and ordinal numbers. The axiomof choice and equivalent formulations. Additional topics. This is the first course in a sequence of three: Mth 534, Mth 535, and Mth 536 which must be taken in sequence.
Also offered for undergraduate-level credit as Mth 434 and may be taken only once for credit. . Prerequis ite: Mth 311.
Mth 535 -Set Theory and Topology II (3)
Introduction to general topology with the notions of interior, closure, topological space, continuity, and homeomorphism. Construction techniques and properties of point-set topology, es pecially connectedness, compactness, and separation. This is the second course in a sequence of three: Mth 534 , Mth 535 , and Mth 536 which must be taken in sequence.
Also offered for undergraduate-level credit as Mth 435 and may be taken only once for credit. . Prerequisite: Mth 534.

## Mth 536 - Set Theory and Topology III (3)

Covering spaces, fundamental group. Additional topics. This is the third course in a sequence of three: Mth534, Mth 535, and Mth 536 which must be taken in sequence.
Also offered for undergraduate-levelcredit as Mth 436 and may be taken only once for credit. . Prerequis ite: Mth 535.

Mth 541 - Introduction to Abstract Algebra I (3)
Group theory and homomorphis mtheorems. This is the first course in a sequence of three: Mth 541, Mth 542, and Mth 543 which must be taken in sequence.
Also offered for undergraduate-level credit as Mth 441 and may be taken only once for credit. . Prerequis ite: Mth 344.

Mth 542 - Introduction to Abstract Algebra II (3)
The theory of rings, modules, and fields. This is thesecond course in a sequence of three: Mth 541, Mth 542, and Mth 543 which must be taken in sequence.
Also offered for undergraduate-level credit as Mth 442 and may be taken only once for credit. . Prerequisite: Mth 541.
Mth 543 - Introduction to Abstract Algebra III (3)
Topics may include: advanced theory of groups, rings, and fields, as well as linear algebra or Galois theory. This is the third course in a sequence of three: Mth 541, Mth 542, and Mth 543 which must be taken in sequence.
Also offered for undergraduate-level credit as Mth 443 and may be taken only once for credit. . Prerequis ite: Mth 542.
Mth 544 - Advanced Linear/Multilinear Algebra I (3)
Vector spaces, linear transformations, matrices, products, quotients, and duals of vector spaces. Minimal and characteristic polynomials, canonical forms. This is the first course in a sequenceof two: Mth 544 and Mth 545 which must be taken in sequence.
Also offered for undergraduate-level credit as Mth 444. Prerequisite: Mth 344.

## Mth 545 - Advanced Linear/Multilinear Algebra II (3)

Multilinear maps, tensor products, exterior algebra. Finite dimensional spectral theory. This is the second coursein a sequence of two: Mth 544 and Mth 545 which must be taken in sequence.
Also offered for undergraduate-level credit as Mth 445. Prerequisite: Mth 544.

## Mth 549 - Topics in Advanced Number Theory (3)

A study of advanced topics selected fromthe areas of algebraic or analytic theory. With departmental approval, this course may be repeated for credit.
Also offered for undergraduate-level credit as Mth 449 and may be taken only once for credit. . Prerequis ite: Mth 346.

## Mth 551 - Numerical Calculus I(3)

Computer arithmetic. Solution of nonlinear equations. Interpolation. Numerical integration and differentiation. Solution of linearequation systems. Eigenvalue problem, least square, Chebyshev, trigonometric and rational function approximation. Numerical solution of differential equations. This is the first course in a sequence of three:

Mth 551, Mth 552, and Mth 553 which must be taken in sequence.

Also offered for undergraduate-level credit as Mth 451 and may be taken only once for credit. . Prerequisite: knowledge of a programming language such as MATLAB or C/C++, Mth 253 and Mth 261.

## Mth 552 - Numerical Calculus II (3)

Computer arithmetic. Solution of nonlinear equations. Interpolation. Numerical integ ration and differentiation. Solution of linear equation systems. Eigenvalue problem, least square, Chebyshev, trigonometric and rational function approximation. Numerical solution of differential equations. This is the second course in a sequenceof three: Mth 551, Mth 552, and Mth 553 which must be taken in sequence.

Also offered for undergraduate-levelcredit as Mth 452 and may be taken only once for credit. . Prerequisite: knowledge of a programming language such as MATLAB or C/C++, Mth 253 and Mth 261.

## Mth 553 - Numerical Calculus III (3)

Computer arithmetic. Solution of nonlinear equations. Interpolation. Numerical integration and differentiation. Solution of linear equation systems. Eigenvalue problem, least square, Chebyshev, trigonometric and rational function approximation. Numerical solution of differential equations. This is the third course in a sequence of three: Mth 551, Mth 552, and Mth 553 which must be taken in sequence.
Also offered for undergraduate-level credit as Mth 453 and may be taken only once for credit. . Prerequisite: knowledge of a programming language such as MATLAB or C/C++, Mth 253 and Mth 261.

## Mth 556 - Topics in Combinatorics (3)

Selected topics from: permutations, combinations, partitions, generating functions, inclusion/exclusion, recursion, Polyacounting, block designs, orthogonal polynomials, and error-correcting codes. With departmental approval may be repeated for credit.
Also offered for undergraduate-levelcredit as Mth 456. Prerequisite: Mth 356 or CS 251.

## Mth 557 - The Mathematical Theory of Games I (3)

Introduction to mathematical game theory and game theoretic analysis. Topics include: combinatorial and strategic games, Perfect Competition, Zermelo's Algorithm, Payoffs, cooperative and non-cooperative games, bargaining, mixed strategies, and Nash Equilibria. Selected applications to economics, biology, computer science, and political science. This is the first course in a sequence of two: Mth 557 and Mth 558 which must be taken in sequence.

Also offered for undergraduate-level credit as Mth 457 and may be taken only once for credit. . Prerequisite: Mth 261 and/or Stat 243.
Mth 558 - The Mathematical Theory of Games II (3)
Introduction to mathematical game theory and game theoretic analysis. Topics include: Dilemma, search, and differential games. Repeated games and finite automata. Common knowledge, complete and incomplete information, behavioral and evolutionary stable strategies, as sessment equilibria. Selected applications to economics, biology, computer science, and political science. This is the second course in a sequenceof two: Mth 557 and Mth 558 which must be taken in sequence.
Also offered for undergraduate-level credit as Mth 458 and may be taken only once for credit. . Prerequisite: Mth 557.

Mth 561 - Graph Theory I (3)
Topics in graph theory, including connectivity, matchings, graph algorithms, network flows, isomorphisms, Eulerian graphs, spanning trees, decompositions, shortest paths, colorings of graphs, and selected applications. This is the first course in a sequence of two: Mth 561 and Mth 562 which must be taken in sequence.
Also offered for undergraduate-level credit as Mth 461 and may be taken only once for credit. . Prerequisite: Mth 261, Mth 356.

## Mth 562 - Graph Theory II (3)

Topics in graph theory, including graph matrices, Hamiltonian graphs, the matrix-tree theorem, planarity and embeddings, Kuratowski's theorem, matroids, and selected applications. This is the second course in a sequence of two: Mth 561 and Mth 562 which must be taken in sequence.

Also offered for undergraduate-level credit as Mth 462 and may be taken only once for credit. . Prerequisite: Mth 561.

## Mth 564 - Numerical Optimization I (3)

Fundamentals of unconstrained optimization, necessary and sufficient conditions, overview of numerical algorithms, rate of convergence, line search and trustregion methods. Gradient descent, conjugate gradient, Newton and quasi-Newton methods, nonlinear leastsquares problems, Gauss-Newton and LevenbergMarquardt methods, practical applications. This is the first course in a sequence of two: Mth 564 and Mth 565. Expected preparation: knowledge of a high-level programming language such as MATLAB, Python, R, or C/C++.
Also offered for undergraduate-level credit as Mth 464 and may be taken only once for credit. Prerequisite: Mth 254 and Mth 261.

## Mth 565 -Numerical Optimization II (3)

Theory of constrained optimization, equality and inequality constraints, Lagrange multipliers, Karush-Kuhn-Tucker (KKT) optimality conditions, penalty methods, quadratic and sequential quadratic programming, applications. This is the second course in a sequence of two: Mth 464/564 and Mth 465/565 which must be taken in sequence.

Also offered for undergraduate-level credit as Mth 465 and may be taken only once for credit. Prerequisite: Mth 564.

## Mth 570 - Complex Analysis and Boundary Value Problems I (3)

Fundamental concepts of complexanalysis. Cauchy's theorem. Analytic functions. Power and Laurent series. Residue Theorem. This is the first course in a sequence of three: Mth 570, Mth 571, and Mth 572 which must be taken in sequence.

Also offered for undergraduate-level credit as Mth 470 and may be taken only once for credit. . Prerequisite: Mth 254 and eitherMth 256 or Mth 421/Mth 521.

## Mth 571 - Complex Analysis and Boundary Value Problems II (3)

Fundamental concepts of complexanalysis. Calculus of res idues and applications. Conformal mappings. Zero-Pole theorem. Infinite products. This is the second course in a sequence of three: Mth 570, Mth 571, and Mth 572 which must be taken in sequence.
Also offered for undergraduate-levelcredit as Mth 471 and may be taken only once for credit. . Prerequisite: Mth 570.

## Mth 572 - Complex Analysis and Boundary Value Problems III (3)

Partial differential equations and boundary value problems using Fourier series. This is the third course in a sequence of three: Mth 570, Mth 571, and Mth 572 which must be taken in sequence.
Also offered for undergraduate-levelcredit as Mth 472 and may be taken only once for credit. . Prerequis ite: Mth 571.

## Mth 577 - Mathematical Control Theory I (3)

Mathematical foundations of lineartime invariant control systems. Controllability, observability, stabilizability, feedback. Applications. This is the first course in a sequence of two: Mth 577 and Mth 578 which must be taken in sequence. Expected preparation: Mth 253 , Mth 254.

Also offered for undergraduate-level credit as Mth 477 and may be taken only once for credit. . Prerequis ite: Mth 256.
Mth 578 - Mathematical Control Theory II (3)
Elements of the calculus of variations and optimal control. Dynamic programming. Pontryagin maximum principle.

Applications. This is the second course in a sequence of two: Mth 577 and Mth 578 which must be taken in sequence.
Also offered for undergraduate-level credit as Mth 478 and may be taken only once for credit. . Prerequisite: Mth 577.

## Mth 581 - Topics in Probability for Mathematics Teachers (2-3)

Selected topics in probability for mathematics teachers. Topics may include origins and development of probability theory, counting theory, laws of probability, conditional probability, independence, odds, standard discrete and continuous probability dis tributions, expected values, moment generating functions, and numerous computer simulations. With departmental approval may be repeated for credit.

Also offered for undergraduate-level credit as Mth 481. Prerequisite: Stat 244 and two upper-division courses approved for math major credit or Stat 452 or Stat 462.

## Mth 582 - Topics inStatistics for Mathematics Teachers (2-3)

Selected topics in statistics for mathematics teachers. Potential topics include descriptivestatistics (measures of center, variability, skewness, etc.), inferential statistics (one and two population problems), Central Limit Theorem, modeling and simulation techniques, and research design techniques. With departmental approval may be repeated for credit.

Also offered for undergraduate-level credit as Mth 482. Prerequisite: Stat 244 and two upper-division courses approved for math major credit or Stat 452 or Stat 462.

## Mth 583 - Topics in Geometry for Mathematics Teachers (2-3)

Selected topics in geometry for mathematics teachers. Potential topics include inductive and deductive reasoning, analytic and metric geometry, isometry and symmetry, and hyperbolic, spherical and/or taxicab geometry. With departmental approval may be repeated for credit.
Also offered for undergraduate-level credit as Mth 483. Prerequisite: Mth 338.

## Mth 584 - Topics in Algebrafor Mathematics Teachers (2-3)

Selected topics in algebra for mathematics teachers. Potential topics may include algebraic structures (groups, rings, fields, vector spaces), equivalence, function, operation, well-defined-ness, equation solving, algorithms, and proving using geometric, symbolic, and verbal representation systems. With departmentalapproval may be repeated for credit.
Also offered for undergraduate-level credit as Mth 484. Prerequisite: Mth 344.

## Mth 585 - Topics in Analysis for Mathematics Teachers (2-3)

Selected topics in analysis for mathematics teachers. Potential topics includefunctions, limits, continuity, derivatives, integration, completeness, covariation, sequences and series, differential equations, complex analys is, and topology. With departmental approval may be repeated for credit.
Also offered for undergraduate-levelcredit as Mth 485. Prerequisite: Mth 311 .

## Mth 586 - Topics in The History of Mathematics (2-3)

Selected topics in the historical development of mathematics. With departmental approval, this course may be repeated for credit.
Also offered for undergraduate-level credit as Mth 486. Prerequisite: at least two upper-division courses approved for major credit.

## Mth 587 - Topics in Discrete Mathematics for Mathematics Teachers (2-3)

Selected topics in discretemathematics forteachers. Potential topics includeset theory, logic, elementary probability theory, relations, recursions, algorithms, counting theory, permutations, financemathematics, combinations, graph theory, algorithms, logic, and number theory. With departmental approval may be repeated for credit.
Also offered for undergraduate-levelcredit as Mth 487. Prerequisite: Mth 356.

## Mth 588 - Topics in Computing for Mathematics Teachers (1-3)

Selected topics and tools for mathematical computing for mathematics teachers. As an example, a simple but powerfulset of programming and graphical tools in ' C ' may be introduced and used to explore a wide range of mathematical topics including statistics, probability, trigonometry, analy tic geometry, calculus and modeling. With departmental approval may be repeated for credit.
Also offered for undergraduate-levelcredit as Mth 488. Prerequisite: Mth 271 or CS 161 and Mth 344.

## Mth 589-Topics in Mathematical Exposition and Curriculum Development (3)

Selected topics in mathematics exposition and curriculum development. Potential topics may include specific mathematical topics (such as algebra, geometry, or statistics) or cross cutting topics (such as ethnomathematics or history of mathematics).
Also offered for undergraduate-level credit as Mth 489.

## Mth 591 - Experimental Probability and Statistics for Middle School Teachers (4)

A study of probability and statis tics through laboratory experiments, simulations, and applications, with integration of problemsolving and technology. Not approved for major credit. Available for graduate credit toward the graduatecertificate programin middle school mathematics.

Also offered for undergraduate-level credit as Mth 491 and may be taken only once for credit. . Prerequisite: Mth 112, Mth 212, Mth 213.

## Mth 593 - Geometry for Middle School Teachers (4)

Selected topics frominformal geometry, both two- and three-dimensional, with integration of problemsolving and technology. Not approved for major credit. Available for graduate credit toward the graduate certificate programin middle school mathematics.
Also offered for undergraduate-level credit as Mth 493 and may be taken only once for credit. . Prerequisite: Mth 112, Mth 212, Mth 213.

## Mth 594 - Arithmetic and Algebraic Structures for Middle School Teachers (4)

The study of the realnumber systemand its subsystems will lead to the introduction of more general algebraic structures and their applications, with focus on problem solving. Not approved for major credit. Available for graduate credit toward the graduate certificate programin middle school mathematics.

Also offered for undergraduate-level credit as Mth 494 and may be taken only once for credit. . Prerequisite: Mth 112, Mth 212, Mth 213.

## Mth 595 - Historical Topics in Mathematics for Middle School Teachers (4)

A survey of the historical development of topics in mathematics fromancient to modern times, with special emphas is on topics in arithmetic, algebra and informal geometry, and with integration of problem solving and technology. Not approved for major credit. Available for graduate credit toward the graduate certificate programin middle school mathematics.

Also offered for undergraduate-level credit as Mth 495 and may be taken only once for credit. . Prerequisite: Mth 112, Mth 212, Mth 213.

## Mth 596 - Concepts of Calculus for Middle School Teachers (4)

An introduction to the limit concept and its role in defining the derivative, the integral and infinite series. Applications to middle school mathematics, with integration of problem solving and technology. Not approved for major credit.

Available for graduate credit toward the graduate certificate programin middle school mathematics.

Also offered for undergraduate-level credit as Mth 496 and may be taken only once for credit. . Prerequisite: Mth 112, Mth 212, Mth 213.

## Mth 597 -Mathematics in the Middle School Classroom (4)

A survey of mathematics taught in the middle school grades, with focus on both content and pedagogical recommendations of the National Councilof Teachers of Mathematics, and with integration of problemsolving and technology. Not approved for major credit. Available for graduate credit toward the graduate certificate programin mathematics for middle school teachers.

Also offered for undergraduate-levelcredit as Mth 497 and may be taken only once for credit. . Prerequisite: Mth 112, Mth 212, Mth 213.

Mth 601 - Research(1-9)
(Credit to be arranged.)

## Mth 603 -Dissertation (1-9)

(Credit to be arranged.)

Mth 604 - Cooperative Education/Internship (1-9)
(Credit to be arranged.)

Mth 605 - Reading and Conference (1-9)
(Credit to be arranged.)

Mth 606 - Special Projects (1-12)
(Credit to be arranged.)

## Mth 607 -Seminar (1-9)

(Credit to be arranged.)

## Mth 609-Practicum()

(Credit to be arranged.)

## Mth 610 -SelectedTopics (1-9)

(Credit to be arranged.)

## Mth 611 - Theory of Functions of a Real Variable I (3)

Lebes gue meas ure and outer meas ure, meas urable functions and the Lebesgue integral, convergence theorems, productmeasures, and Fubini's theorem. Lp spaces, derivates, derivative, finite variation and absolutely continuous functions. Courses must be taken in sequence. Expected preparation: Mth 412/Mth 512.

## Mth 612 - Theory of Functions of a Real Variable II (3)

Lebes gue measure and outer measure, measurable functions and the Lebesgue integral, convergence theorems, productmeasures, and Fubini's theorem. Lp spaces, derivates, derivative, finite variation and absolutely continuous functions. Courses must be taken in sequence. Expected preparation: Mth 412/Mth 512.

## Mth 613 - Theory of Functions of a Real Variable III (3)

Lebes gue measure and outer measure, meas urable functions and the Lebesgue integral, convergence theorems, product measures, and Fubini's theorem. Lp spaces, derivates, derivative, finite variation and absolutely continuous functions. Courses must be taken in sequence. Expected preparation: Mth 412/Mth 512.

## Mth 614 - Modern Analysis I (3)

Topics fromnonlinearanalysis, harmonic analysis, analytic functions, ordered vector spaces, analysis on Lie groups, and operator theory. This is the first course in a sequence of three: Mth 614, Mth 615, and Mth 616. Expected preparation: Mth 412/Mth 512.

## Mth 615 - Modern Analysis II (3)

Topics fromnonlinear analysis, harmonic analysis, analytic functions, ordered vector spaces, analysis on Lie groups, and operator theory. This is the second course in a sequence of three: Mth 614, Mth 615, and Mth 616. Expected preparation: Mth 412/Mth 512.

## Mth 616 - Modern Analysis III (3)

Topics fromnonlinear analysis, harmonic analysis, analytic functions, ordered vector spaces, analysis on Lie groups, and operator theory. This is the third course in a sequence of three: Mth 614, Mth 615, and Mth 616. Expected preparation: Mth 412/Mth 512.

## Mth 617 - Functional Analysis I(3)

Hilbert and Banach spaces, the Hahn-Banach, open mapping, and closed graph theorems. Compact, selfadjoint, normal, and Fredholmoperators. Locally convex spaces, weak topologies, duality. Banach- and C* algebras, spectral theory. This is the first course in a sequence of three: Mth 617, Mth 618, and Mth 619 which must be taken in sequence. Expected preparation: Mth 412/Mth 512.

## Mth 618 - Functional Analysis II (3)

Hilbert and Banach spaces, the Hahn-Banach, open mapping, and closed graph theorems. Compact, selfadjoint, normal, and Fredholmoperators. Locally convex spaces, weak topologies, duality. Banach- and C* algebras, spectral theory. This is the second course in a sequence of three: Mth 617, Mth 618, and Mth 619 which must be taken in sequence. Expected preparation: Mth 412/Mth 512.

## Mth 619 - Functional Analysis III (3)

Hilbert and Banach spaces, the Hahn-Banach, open mapping, and closed graph theorems. Compact, selfadjoint, normal, and Fredholmoperators. Locally convex spaces, weak topologies, duality. Banach- and C* algebras, spectral theory. This is the third course in a sequence of three: Mth 617, Mth 618, and Mth 619 which must be taken in sequence. Recommended prerequisite: Mth 412/Mth 512.

## Mth 621 - Advanced Differential Equations I (3)

Advanced theory of dynamial systems and partial differentialequations including the basics of partial differentialequations, boundary value problems for elliptic equations, the Cauchy problem, and parabolic equations. Topics selected fromHamiltonian systems, waves and shocks, variational methods, control theory. This is the first course in a sequence of three: Mth 621, Mth 622, and Mth 623. Expected preparation: Mth 423/Mth 523 or Mth 472/Mth 572.

## Mth 622 - Advanced Differential Equations II (3)

Advanced theory of dynamial systems and partial differential equations including the basics of partial differentialequations, boundary value problems for elliptic equations, the Cauchy problem, and parabolic equations.
Topics selected fromHamiltonian systems, waves and shocks, variational methods, control theory. This is the second course in a sequence of three: Mth 621, Mth 622,
and Mth 623. Expected preparation: Mth 423/Mth 523 or Mth 472/Mth 572.

Mth 623 - Advanced Differential Equations III (3)
Advanced theory of dynamial systems and partial differential equations including the basics of partial differential equations, boundary value problems for elliptic equations, the Cauchy problem, and parabolic equations. Topics selected fromHamiltonian systems, waves and shocks, variational methods, control theory. This is the third course in a sequence of three: Mth 621, Mth 622, and Mth 623. Expected preparation: Mth 423/Mth 523 or Mth 472/Mth 572.

## Mth 624 - Advanced Differential Geometry I (3)

Topics selected fromdifferentiable manifolds, differential forms, DeRham cohomology, Lie groups, fibre bundles, the Riemannian metric, affine and Riemannian connections, parallel trans lations, holonomy, geodesics, curvature, isometric embeddings and hypersurfaces, the Second FundamentalForm, complete Riemannian manifolds and the Hopf-Rinow theorem, spaces of constant curvature, variations of arc length, and the Morse Index theorem. This is the first course in a sequence of three: Mth 624, Mth 625, and Mth 626. Expected preparation: Mth 425/Mth 525.

## Mth 625 - Advanced Differential Geometry II (3)

Topics selected fromdifferentiable manifolds, differential forms, DeRham cohomology, Lie groups, fibre bundles, the Riemannian metric, affine and Riemannian connections, parallel trans lations, holonomy, geodesics, curvature, isometric embeddings and hypersurfaces, the Second FundamentalForm, complete Riemannian manifolds and the Hopf-Rinow theorem, spaces of constant curvature, variations of arc length, and the Morse Index theorem. This is the second course in a sequence of three: Mth 624, Mth 625, and Mth 626. Expected preparation: Mth 425/Mth 525.

## Mth 626 - Advanced Differential Geometry III (3)

Topics selected fromdifferentiable manifolds, differential forms, DeRham cohomology, Lie groups, fibre bundles, the Riemannian metric, affine and Riemannian connections, parallel translations, holonomy, geodesics, curvature, isometric embeddings and hypersurfaces, the Second FundamentalForm, complete Riemannian manifolds and the Hopf-Rinow theorem, spaces of constant curvature, variations of arc length, and the Morse Index theorem. This is the third course in a sequence of three:

Mth 624, Mth 625, and Mth 626. Expected preparation: Mth 425/Mth 525.

## Mth 634 - Algebraic Topology I (3)

Topics fromsingular and simplicial homology and cohomology theories, fundamental group and covering spaces, CW complexes and elements of homotopy theory, algebraic theory of manifolds, introduction to differential topology and vector bundles, applications. This is the first course in a sequenceof three: Mth 634, Mth 635, and Mth 636 which must be taken in sequence. Recommended prerequisites:Mth 435/Mth 535 and Mth 444/Mth 544.

## Mth 635 - Algebraic Topology II (3)

Topics froms ingular and simplicial homology and cohomology theories, fundamental group and covering spaces, CW complexes and elements of homotopy theory, algebraic theory of manifolds, introduction to differential topology and vector bundles, applications. This is the second course in a sequence of three: Mth 634, Mth 635, and Mth 636 which must be taken in sequence. Expected preparation: Mth 435/Mth 535 and Mth 444/Mth 544.

## Mth 636 - Algebraic Topology III (3)

Topics froms ingular and simplicial homology and cohomology theories, fundamental group and covering spaces, CW complexes and elements of homotopy theory, algebraic theory of manifolds, introduction to differential topology and vector bundles, applications. This is the third course in a sequenceof three: Mth 634, Mth 635, and Mth 636 which must be taken in sequence. Expected preparation: Mth 435/Mth 535 and Mth 444/Mth 544.

## Mth 637 - Geometric Topology I (3)

Topics fromgeometric and piecewise linear topology, knots and 3-manifolds and gauge theories, geometric structures and geometrization of manifolds, applications to differential topology, vector bundles and to mathematical physics. This is the first course in a sequence of three: Mth 637 Mth 638, and Mth 639. Expected preparation: Mth 436/Mth 536.

## Mth 638-Geometric Topology II (3)

Topics fromgeometric and piecewise linear topology, knots and 3-manifolds and gauge theories, geometric structures and geometrization of manifolds, applications to differential topology, vector bundles and to mathematical physics. This is the second course in a sequence of three:

Mth 637 Mth 638, and Mth 639. Expected preparation: Mth 436/Mth 536.

## Mth 639-Geometric Topology III (3)

Topics fromgeometric and piecewise linear topology, knots and 3-manifolds and gauge theories, geometric structures and geometrization of manifolds, applications to differential topology, vector bundles and to mathematical physics. This is the third course in a sequence of three: Mth 637 Mth 638, and Mth 639. Expected preparation: Mth 436/Mth 536.

## Mth 641 - Modern Algebra I (3)

Topics fromgroups, semigroups, rings, fields, algebras, and homological algebra. This is the first course in a sequence of three: Mth 641, Mth 642, and Mth 643. Expected preparation: Mth $443 / \mathrm{Mth} 543$ or both Mth 442/Mth 542 and Mth 445/Mth 545.

## Mth 642 - Modern Algebra II (3)

Topics fromgroups, semigroups, rings, fields, algebras, and homological algebra. This is the second course in a sequence of three: Mth 641, Mth 642, and Mth 643. Expected preparation: Mth $443 /$ Mth 543 or both Mth 442/Mth 542 and Mth 445/Mth 545.

## Mth 643 - Modern Algebra III (3)

Topics fromgroups, semigroups, rings, fields, algebras, and homological algebra. This is the third course in a sequence of three: Mth 641, Mth 642, and Mth 643. Expected preparation: Mth $443 / \mathrm{Mth} 543$ or both Mth 442/Mth 542 and Mth 445/Mth 545.

## Mth 651 - Advanced Numerical Analysis I(3)

An advanced study of numericalmethods with emphasis on theory, economy of computation, and the solution of pathological problems. Topics will typically be chosen from: evaluation of functions, roots of equations, quadrature, ordinary and partial differential equations, integral equations, eigenvalues, construction of approximating functions, orthonomalizing codes, and treatment of singularities. This is the first course in a sequence of three:Mth 651, Mth 652, and Mth 653 which must be taken in sequence. Expected preparation: Mth 311.

## Mth 652 -Advanced Numerical Analysis II (3)

An advanced study of numerical methods with emphasis on theory, economy of computation, and the solution of pathological problems. Topics will typically be chosen from: evaluation of functions, roots of equations, quadrature, ordinary and partial differential equations, integral equations, eigenvalues, construction of approximating functions, orthonomalizing codes, and treatment of singularities. This is the second course in a sequence of three: Mth 651, Mth 652, and Mth 653 which must be taken in sequence. Expected preparation: Mth 453/Mth 553.

## Mth 653 - Advanced Numerical Analysis III (3)

An advanced study of numerical methods with emphasis on theory, economy of computation, and the solution of pathological problems. Topics will typically be chosen from: evaluation of functions, roots of equations, quadrature, ordinary and partial differential equations, integral equations, eigenvalues, construction of approximating functions, orthonomalizing codes, and treatment of singularities. This is the third course in a sequence of three: Mth 651, Mth 652, and Mth 653 which must be taken in sequence. Expected preparation: Mth 453/Mth 553.

## Mth 661 - Algebraic Graph Theory I (3)

Topics selected fromalgebraic and spectral graph theory, including automorphis mgroups, transitivity, primitivity, homomorphisms, generalized polygons, designs, projective planes, cores, fractional colorings and cliques, spectral decomposition, eigenvalue interlacing, strongly-regular and distance-regular graphs, line graphs, root systems, graph laplacians, graph polynomials, and graph-theoretic link invariants. This is the first course in a sequence of three: Mth 661, Mth 662, and Mth 663 which must be taken in sequence.
Prerequisite: Mth 462 or Mth 562.

## Mth 662 - Algebraic Graph Theory II (3)

Topics selected fromalgebraic and spectral graph theory, including automorphismgroups, transitivity, primitivity, homomorphisms, generalized polygons, designs, projective planes, cores, fractional colorings and cliques, spectral decomposition, eigenvalue interlacing, strongly-regular and distance-regular graphs, line graphs, root systems, graph laplacians, graph polynomials, and graph-theoretic link invariants. This is the second course in a sequenceof three: Mth 661, Mth 662, and Mth 663 which must be taken in sequence.
Prerequisite: Mth 462 or Mth 562.

## Mth 663 - Algebraic Graph Theory III (3)

Topics selected fromalgebraic and spectral graph theory, including automorphis mgroups, transitivity, primitivity, homomorphisms, generalized polygons, designs, projective planes, cores, fractional colorings and cliques, spectral decomposition, eigenvalue interlacing, strongly-regular and distance-regular graphs, line graphs, root systems, graph laplacians, graph polynomials, and graph-theoretic link invariants. This is the third course in a sequence of three: Mth 661, Mth 662, and Mth 663 which must be taken in sequence.

Prerequisite: Mth 462 or Mth 562.
Mth 667 - Stochastic Processes and Probability Theory I (3)

Sets, spaces, and measures. Probability distributions. Randomvariables. Dependence. Limit theorems. Birth and death processes and Markov processes. Mathematical statistics, hypothesis testing, and sequential analysis. Selected applications. This is the first course in a sequence of three: Mth 667, Mth 668, Mth 669 which must be taken in sequence. Expected preparation: Mth 411/Mth 511, Stat 463/Stat 563.

## Mth 668 -Stochastic Processes and Probability Theory II (3)

Sets, spaces, and measures. Probability distributions. Randomvariables. Dependence. Limit theorems. Birth and death processes and Markov processes. Mathematical statistics, hypothesis testing, and sequential analysis. Selected applications. This is the second course in a sequence of three: Mth 667, Mth 668, Mth 669 which must be taken in sequence. Expected preparation: Mth 411/Mth 511, Stat 463/Stat 563.

## Mth 669 - Stochastic Processes and Probability Theory III (3)

Sets, spaces, and measures. Probability distributions. Randomvariables. Dependence. Limit theorems. Birth and death processes and Markov processes. Mathematical statistics, hypothesis testing, and sequential analysis. Selected applications. This is the third course in a sequence of three: Mth 667, Mth 668, Mth 669 which must be taken in sequence. Expected preparation: Mth 411/Mth 511, Stat 463/Stat 563.

## Mth 690 - Introduction to Research in Mathematics Education (3)

Topics in the history of mathematics education including an examination of the current research trends in mathematics education.

## Mth 691 - Curriculumin Mathematics Education (3)

An analysis of curriculumdevelopment and assessment efforts in mathematics education both past and present.

## Mth 692 - Research Methodology and Design (3)

An examination of quantitative and qualitative research methodologies and their applications to the design of research in mathematics education.

## Mth 693 - Research on the Learning of Mathematics (3)

An analysis of the mathematics education research on the learning of mathematics, including topics fromK-16 mathematics.

Mth 694 - Research on the Teaching of Mathematics (3)
An analysis of the research on the teaching of mathematics, including is sues fromlevels K-16.

## Mth 695 - Topics in Research in Mathematics Education (3)

A special topics seminar devoted to exploring particular is sues in more depth.

## Mth 696 - Mathematical Knowledge for Teaching \& Educational Research Grades K-16 (3)

Explore and develop mathematical knowledge for teaching and educational research related to the K-16 grade band. Expected preparation is a bachelors degree in mathematics or equivalent. The goal will be to build on students' core mathematical knowledge in ways that will support themin classroomteaching and in conducting research on the teaching and learning of mathematics. Expected preparation: Equivalent of an undergraduate degree in mathematics. This course may be repeated up to three times for credit.

## Mth 697 - Advanced Mathematics for Teaching \& Educational Research (3)

Develop knowledgeof advanced mathematics for teaching and educational research. Expected preparation is a bachelors degree in mathematics or equivalent. The goal is to build on students' knowledge of advanced mathematics (from pure mathematics course work) in ways that will support themin undergraduateclassroomteaching and in conducting research on the teaching and learning of
undergraduate mathematics. Further, the course supports students in making connections between K-16 mathematics and advanced (graduate level) mathematics. Expected preparation: Equivalent of an undergraduate degreein mathematics. This course may be repeated up to three times for credit.

Mth 801 - Research (1-12)
(Credit to be arranged.)

Mth 802 - Independent Study (1-12)
(Credit to be arranged.)

Mth 804 -Cooperative Education/Internship (1-12)
(Credit to be arranged.)

## Mth 805 - Reading and Conference (1-12)

(Credit to be arranged.)

Mth 806 -Special Problems/Projects (1-12)
(Credit to be arranged.)

Mth 807 -Seminar (1-12)
(Credit to be arranged.)

## Mth 808 - Workshop(0-12)

(Credit to be arranged.)

## Mth 809 - Practicum (1-12)

(Credit to be arranged.)

Mth 810 -SelectedTopics (1-12)
(Credit to be arranged.)

## MuEd - Music Education

## MuEd 045 -Music Education Degree Entry Portfolio (0)

All students applying to the Music Education degree programwill complete and submit a portfolio detailing
interest and abilities needed to become a successfulk-12 Music educator. Will serve as a prerequisite for all MuEd 400 -level courses.

## MuEd 328 - Introduction to Music Education (2)

Overview of the music education profession, with emphasis on the various levels, genres, options, and requirements of the field. Concurrent enrollment in an appropriate practicum(Mus 409) required.

Prerequisite: Mus 111, 112, 113.
MuEd 332 -String Techniques (1)
Study of the stringed instrument family for students in the teachereducation program. Special emphasis will be given to the teaching of these instruments to groups of young and/or inexperienced students.

## MuEd 333-Guitar Techniques (1)

Study of the guitar and the methods and materials used to teach guitar to young and/or inexperienced students. Required for students in the Music Education Program.

## MuEd 334 - Vocal Techniques K-12 (1)

Study of vocal techniques forstudents in the teacher education program. Special emphasis will be given to teaching voice to groups of young and/or inexperienced students fromchildhood through high school.

## MuEd 335 - Percussion Techniques (1)

Study of the percussion instruments of orchestra and band for students in the teacher education program. Special emphasis will be given to the teaching of these instruments to groups of young and/or inexperienced students.

## MuEd 336 - Flute and Double Reeds (1)

Study of how to teach and play flute and double reeds (bassoon and oboe) for students enrolled in the teacher education program.

## MuEd 337-Clarinet and Saxophone (1)

Study of how to teach and play clarinet and saxophone for students enrolled in the teacher education program.

## MuEd 338-High Brass Techniques (1)

Study of how to teach and play trumpet and horn for students enrolled in the teacher education program.

## MuEd 339 - Low Brass Techniques (1)

Study of how to teach and play trombone, euphonium and tuba for students enrolled in the teacher education program.

## MuEd 340-Wind Instrument Techniques (3)

Forstudents in the Choral/General Music Education track. Techniques of brass and woodwind instruments for groups of young students with special emphasis on resources, beginning techniques, and appropriate literature.

## MuEd 341 -Jazz Techniques (1)

Study of techniques used in the teaching of middle and high school ins trumental jazz music. Includes rehearsal techniques, basic arranging, swing concepts, rhythm section concepts, and improvisation.
Prerequisite: ins tructor approval.
MuEd 399 -Special Studies (1-6)
(Credits to be arranged.)

## MuEd 408-Workshop(1-6)

(Credit to be arranged.)

MuEd 409 - Practicum (1-12)
(Credit to be arranged.)

## MuEd 420-Choral Literature and Rehearsal Techniques I (3)

Students will learn the es sentials of rehearsing large choral groups fromgrades 5-8 and requisite materials and techniques for starting and building a middle school choral program. This is the first course in a sequence of two: MuEd 420 and MuEd 421.
Also offered for graduate-level credit as MuEd 520 and may be taken only once for credit. . Prerequisite: MuEd 045, Mus 322, MuEd 328, MuEd 334.

## MuEd 421 - Choral Literature and Rehearsal Techniques II (3)

Students will learn the es sentials of rehearsing large choral groups fromgrades 9-12 and requisite materials and techniques for starting and building a high school choral program. This is the second coursein a sequence of two: MuEd 420 and MuEd 421.

Also offered for graduate-level credit as MuEd 521 and may be taken only once for credit. . Prerequisite: MuEd 045, Mus 322, MuEd 328, MuEd 334.

## MuEd 422 - Instrumental Literature and Rehearsal Techniques I (3)

Study of the literature and rehearsal techniques for teaching instrumental music in grades 5-8 primarily. Student will serve as a lab ensemble for each other and will play primary and secondary instruments. Score study, appropriate literature selection and administration of a middle school instrumental programare the core areas of study.
Also offered for graduate-level credit as MuEd 522 and may be taken only once for credit. . Prerequis ite: MuEd 045, Mus 321, MuEd 328, MuEd 335, MuEd 336, and MuEd 337. .

## MuEd 423 - Instrumental Literature and Rehearsal Techniques II (3)

Study of the literature and rehearsal techniques for teaching in strumental music in grades 9-12, primarily. Student will serve as a lab ensemble for each other and will play primary and secondary instruments. Score study, appropriate literature selection and adminis tration of a high school instrumental programare the core areas of study.
Also offered for graduate-level credit as MuEd 523 and may be taken only once for credit. . Prerequisite: MuEd 045, Mus 321, MuEd 328, MuEd 335, MuEd 336, MuEd 337, MuEd 421, and MuEd 521 .

## MuEd 480-Kodály Training: Level I (5)

A two-week intensive introduction to the Kodály approach and its applications in the field of Music Education. Students will participate in pedagogy, folk music, musicianship, materials, andchoirclas ses within the course.

Also offered for graduate-level credit as MuEd 580 and may be taken only once for credit. . Prerequisite: junior standing.

## MuEd 481 - Kodály Training: Level II (5)

A two-week continuation of the Kodály approach and its applications in the field of Music Education. Students will participate in pedagogy, folk music, musicianship, materials, conducting, and choir classes within the course.

Also offered for graduate-level credit as MuEd 581 and may be taken only once for credit. . Prerequisite: MuEd 480 or MuEd 580 orother Kodály Level 1 coursework.

## MuEd 482 -Kodály Training: Level III (5)

The third course in the Kodály approach andits applications in the field of Music Education. Students will participate in pedagogy, folk music, musicianship, materials, conducting, and choir clas ses with in the course.
Also offered for graduate-level credit as MuEd 582 and may be taken only once for credit. . Prerequisite: MuEd 481 or MuEd 581 orother Kodály Level II coursework.

## MuEd 484 -Music with Children (3)

Methods and materials forteaching general music classes in the elementary school. Designed forthe music specialist; required of all students who seek a basic teaching certificate in music. It is presupposed that all students have performing and theoretical skills and at least one year of music history. Concurrent enrollment in an appropriate practicum(Mus 409) required.
Also offered for graduate-level credit as MuEd 584 and may be taken only once for credit. . Prerequisite: MuEd 045 and MuEd 328.

## MuEd 508-Workshop(1-9)

(Credit to be arranged.)

## MuEd 509-Practicum(1-9)

(Credit to be arranged.)

## MuEd 520-Choral Literature and Rehearsal Techniques I (3)

Students will learn the es sentials of rehearsing large choral groups fromgrades 5-8 and requisite materials and techniques for starting and building a middle school choral program. This is the first course in a sequenceof two: MuEd 520 and MuEd 521.

Also offered for undergraduate-level credit as MuEd 420 and may be taken only once for credit. . Prerequisite: MuEd 045, Mus 322, MuEd 328, MuEd 334.

## MuEd 521 -Choral Literature and Rehearsal Techniques II (3)

Students will learn the es sentials of rehearsing large choral groups fromgrades 9-12 and requisite materials and techniques for starting and building a high school choral program. This is the second course in a sequence of two: MuEd 520 and MuEd 521.

Also offered for undergraduate-level credit as MuEd 421 and may be taken only once for credit. . Prerequisite: MuEd 045, Mus 322, MuEd 328, MuEd 334.
MuEd 522 - Instrumental Literature and Rehearsal Techniques I (3)
Study of the literature and rehearsal techniques for teaching instrumental music in grades 5-8 primarily. Student will serve as a lab ensemble for each other and will play primary and secondary instruments. Score study, appropriate literature selection and administration of a middle school instrumental programare the core areas of study.
Also offered for undergraduate-level credit as MuEd 422 and may be taken only once for credit. . Prerequisite: Mus 321, MuEd 328, MuEd 335, MuEd 336, MuEd 337.

## MuEd 523 - Instrumental Literature and Rehearsal Techniques II (3)

Study of the literature and rehearsal techniques for teaching instrumental music in grades 9-12, primarily. Student will serve as a lab ensemble for each other and will play primary and secondary instruments. Score study, appropriate literature selection and administration of a high school ins trumental programare the core areas of study.
Also offered for undergraduate-level credit as MuEd 423 and may be taken only once for credit. . Prerequisite: Mus 321, MuEd 328, MuEd 335, MuEd 336, MuEd 337, MuEd 422 or MuEd 522.

MuEd 530 - Managing the Music Classroom (2)
Focus on classroommanagement techniques specific to music clas srooms in k-12 schools, both large ensembles and general music courses. Students will research and problem-solve challenges in these unique classes.

## MuEd 580-Kodály Training: Level I (5)

A two-week intensive introduction to the Kodály approach and its applications in the field of Music Education. Students will participate in pedagogy, folk music, musicianship, materials, and choir classes within the course.

Also offered for undergraduate-levelcredit as MuEd 480 and may be taken only once for credit. . Prerequis ite: juniorstanding.
MuEd 581 - Kodály Training: Level II (5)
A two-week continuation of the Kodály approach and its applications in the field of Music Education. Students will participate in pedagogy, folk music, musicianship, materials, conducting, and choir classes within the course.
Also offered for undergraduate-level credit as MuEd 481 and may be taken only once for credit. . Prerequis ite:

MuEd 480 or MuEd 580 or other Kodály Level 1 coursework.

## MuEd 582 - Kodály Training: Level III (5)

The third course in the Kodály approach and its applications in the field of Music Education. Students will participate in pedagogy, folk music, musicianship, materials, conducting, and choir clas ses within the course.
Also offered for undergraduate-level credit as MuEd 482 and may be taken only once forcredit. . Prerequisite: MuEd 481 or MuEd 581 or other Kodály Level II coursework.

## MuEd 583 -Kodály Training: Level IV (5)

The final course in the Kodály approach and its applications in the field of Music Education. Students will prepare a dvd of their teaching and present their projects/dvds for evaluation as well as participate in pedagogy, folk music, musicianship, materials, conducting, and choir clas ses within the course.

Prerequisite: MuEd 482/582 or other Kodaly Level III coursework.

## MuEd 584 -Music with Children (3)

Methods and materials forteaching general music classes in the elementary school. Designed for the music specialist; required of all students who seek a basic teaching certificate in music. It is presupposed that all students have performing and theoretical skills and at least one year of music history. Concurrent enrollment in an appropriate practicum(Mus 409) required.
Also offered for undergraduate-level credit as MuEd 484 and may be taken only once forcredit. . Prerequisite: upper-division standing in music.

## Mup - Applied Music

## Mup 190 - Applied Music (1-4)

Freshman year. Individual instruction in org an, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.
Prerequisite: approval of faculty applied music supervisor.

## Mup 190A - Applied Music: Trombone (1-4)

Freshman year. Individual instruction in organ, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits .

Prerequisite: approval of faculty applied music supervisor. Corequisite: Mus 195.

## Mup 190B - Applied Music: Bass (1-4)

Freshman year. Individual instruction in org an, piano, harpsichord, voice, guitar, orchestral and band ins truments. Maximum: 12 credits.

Prerequisite: approval of faculty applied music supervisor.

## Mup 190C - Applied Music: Cello (1-4)

Freshman year. Individual instruction in organ, piano, harps ichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits .

Prerequisite: approval of faculty applied music supervisor. Corequisite: Mus 196.

## Mup 190D - Applied Music: Percussion (1-4)

Freshman year. Individual instruction in organ, piano, harpsichord, voice, guitar, orchestral and band ins truments. Maximum: 12 credits .

Prerequisite: approval of faculty applied music supervisor. Corequisite: Mus 195.
Mup 190E- Applied Music: Farly Instruments (1-4)
Freshman year. Individual instruction in organ, piano, harps ichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits .

Prerequisite: approval of faculty applied music supervisor. Corequisite: Mus 197.

## Mup 190F - Applied Music: French Horn (1-4)

Freshman year. Indiv idual instruction in organ, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.

Prerequisite: approval of faculty applied music supervisor. Corequisite: Mus 195.

## Mup 190G- Applied Music: Guitar (1-4)

Freshman year. Individual instruction in organ, piano, harps ichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits .

Prerequisite: approval of faculty applied music supervisor. Corequisite: Mus 196.

Mup 190H- Applied Music: Harpsichord/Organ (1-4)
Freshman year. Individual instruction in organ, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits .

## Mup 190I- Applied Music: Flute (1-4)

Freshman year. Individual instruction in organ, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits .

Prerequisite: approval of faculty applied music supervisor. Corequisite: Mus 195.

## Mup 190J - Applied Music: Jazz Studies (1-4)

Freshman year. Individual instruction in org an, piano, harps ichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.

Prerequisite: approval of faculty applied music supervisor. Corequisite: Mus 198.

## Mup 190K- Applied Music: Clarinet (1-4)

Freshman year. Individual instruction in org an, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.

Prerequis ite: approval of faculty applied music supervisor. Corequisite: Mus 195.

## Mup 190L - Applied Music: Bassoon (1-4)

Freshman year. Individual instruction in org an, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.
Prerequisite: approval of faculty applied music supervisor. Corequisite: Mus 195.

## Mup 190M- Applied Music: Composition (1-4)

Freshman year. Individual instruction in org an, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.

Prerequisite: approval of faculty applied music supervisor. Corequisite: Mus 185.

## Mup 190N - Applied Music: Non-Western (1-2)

Freshman year. Individual instruction in org an, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.
Prerequisite: approval of faculty applied music supervisor.
Mup 1900-Applied Music: Oboe (1-4)
Freshman year. Individual instruction in org an, piano, harps ichord, voice, guitar, orchestral and band ins truments. Maximum: 12 credits.
Prerequisite: approval of faculty applied music supervisor.
Corequisite: Mus 195.

## Mup 190P - Applied Music: Piano (1-4)

Freshman year. Individual instruction in org an, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.

Prerequis ite: approval of faculty applied music supervisor. Corequisite: Mus 197.

## Mup 190Q-Applied Music: Harp (1-4)

Freshman year. Individual instruction in org an, piano, harpsichord, voice, guitar, orchestral and band ins truments. Maximum: 12 credits.

Prerequisite: approval of faculty applied music supervisor. Corequisite: Mus 197.

## Mup 190S - Applied Music: Violin (1-4)

Freshman year. Individual instruction in organ, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits .

Prerequisite: approval of faculty applied music supervisor. Corequisite: Mus 196.

## Mup 190T - Applied Music: Trumpet (1-4)

Freshman year. Individual instruction in organ, piano, harpsichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.
Prerequisite: approval of faculty applied music supervisor. Corequisite: Mus 195.

## Mup 190U- Applied Music: Trombone (1-4)

Freshman year. Individual instruction in organ, piano, harpsichord, voice, guitar, orchestral and band ins truments. Maximum: 12 credits .

Prerequisite: approval of faculty applied music supervisor. Corequisite: Mus 195.

## Mup 190V - Applied Music: Voice (1-4)

Freshman year. Individual instruction in organ, piano, harps ichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits .

Prerequisite: approval of faculty applied music supervisor. Corequisite: Mus 197.

## Mup 190W - Applied Music: Tuba (1-4)

Freshman year. Individual instruction in organ, piano, harps ichord, voice, guitar, orchestral and band ins truments. Maximum: 12 credits .

Prerequisite: approval of faculty applied music supervisor. Corequisite: Mus 195.

## Mup 190X - Applied Music: Euphonium (1-4)

Freshman year. Individual instruction in organ, piano, harps ichord, voice, guitar, orchestral and band ins truments. Maximum: 12 credits .

Prerequisite: approval of faculty applied music supervisor. Corequisite: Mus 195.

Mup 190Y - Applied Music: Viola (1-4)
Freshman year. Individual instruction in org an, piano, harps ichord, voice, guitar, orchestral and band ins truments. Maximum: 12 credits .

Prerequisite: approval of faculty applied music supervisor. Corequisite: Mus 196.

## Mup 190Z-Applied Music: Saxophone (1-4)

Freshman year. Individual instruction in org an, piano, harps ichord, voice, guitar, orchestral and band instruments. Maximum: 12 credits.

Prerequisite: approval of faculty applied music supervisor. Corequisite: Mus 195.

## Mup 290 -Applied Music (1-4)

Sophomore year. Continuation of Mup 190. Maximum: 12 credits.

Prerequisite: Mup 190 and audition.
Mup 290A - Applied Music: Trombone (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.

Prerequisite: MuP 190 and audition. Corequisite: Mus 195.
Mup 290B - Applied Music: Bass (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.

Prerequisite: MuP 190 and audition.
Mup 290C - Applied Music: Cello (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.

Prerequisite: MuP 190 and audition. Corequisite: Mus 196.
Mup 290D - Applied Music: Percussion (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.

Prerequisite: MuP 190 and audition. Corequisite: Mus 195.
Mup 290E- Applied Music: Early Instruments (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.

Prerequisite: MuP 190 and audition. Corequisite: Mus 197.
Mup 290F - Applied Music: French Horn (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.

Prerequisite: MuP 190 and audition. Corequisite: Mus 195.

## Mup 290G- Applied Music: Guitar (1-4)

Sophomore year. Continuation of MuP 190. Maximum: 12 credits.
Prerequisite: MuP 190 and audition. Corequisite: Mus 196.
Mup 290H-Applied Music: Harpsichord/Organ (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.

## Mup 290I- Applied Music: Flute (1-4)

Sophomore year. Continuation of MuP 190. Maximum: 12 credits.

Prerequisite: MuP 190 and audition. Corequisite: Mus 195.
Mup 290J - Applied Music: Jazz Studies (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.

Prerequisite: MuP 190 and audition. Corequisite: Mus 198.
Mup 290K- Applied Music: Clarinet (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.
Prerequisite: MuP 190 and audition. Corequisite: Mus 195.
Mup 290L - Applied Music: Bassoon (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.

Prerequisite: MuP 190 and audition. Corequisite: Mus 195.

## Mup 290M - Applied Music: Composition (1-4)

Sophomore year. Continuation of MuP 190. Maximum: 12 credits.
Prerequisite: MuP 190 and audition. Corequisite: Mus 185.
Mup 2900-Applied Music: Oboe (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.
Prerequisite: MuP 190 and audition. Corequisite: Mus 195.
Mup 290P - Applied Music: Piano (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.
Prerequisite: MuP 190 and audition. Corequisite: Mus 197.
Mup 290Q - Applied Music: Harp (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.
Prerequisite: MuP 190 and audition. Corequisite: Mus 197.
Mup 290S - Applied Music: Violin (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.
Prerequisite: MuP 190 and audition. Corequisite: Mus 196.
Mup 290T - Applied Music: Trumpet (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.

Prerequisite: MuP 190 and audition. Corequisite: Mus 195.

Mup 290U- Applied Music: Trombone (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.

Prerequisite: MuP 190 and audition. Corequisite: Mus 195.
Mup 290V - Applied Music: Voice (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.

Prerequisite: MuP 190 and audition. Corequisite: Mus 197.
Mup 290W - Applied Music: Tuba (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.

Prerequisite: MuP 190 and audition. Corequisite: Mus 195.
Mup 290X - Applied Music: Euphonium (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.

Prerequisite: MuP 190 and audition. Corequisite: Mus 195.
Mup 290Y - Applied Music: Viola (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.

Prerequisite: MuP 190 and audition. Corequisite: Mus 196.
Mup 290Z-Applied Music: Saxophone (1-4)
Sophomore year. Continuation of MuP 190. Maximum: 12 credits.

Prerequisite: MuP 190 and audition. Corequisite: Mus 195.

## Mup 390 -Applied Music (1-4)

Junior year. Continuation of Mup 290. Maximum: 12 credits.

Prerequisite: Mup 290 and upper division examination.
Mup 390A - Applied Music: Trombone (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.

Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 395.
Mup 390B - Applied Music: Bass (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.

Prerequisite: MuP 290 and upper division examination.
Mup 390C - Applied Music: Cello (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.

Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 396.

Mup 390D - Applied Music: Percussion (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.

Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 395.

Mup 390E- Applied Music: Early Instruments (1-4) Junior year. Continuation of MuP 290. Maximum: 12 credits.

Prerequisite: MuP 290 and upper divis ion examination. Corequisite: Mus 397.
Mup 390F - Applied Music: French Horn (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.

Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 395.
Mup 390G- Applied Music: Guitar (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.
Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 396.

Mup 390H- Applied Music: Harpsichord/Organ (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.

## Mup 390I- Applied Music: Flute (1-4)

Junior year. Continuation of MuP 290. Maximum: 12 credits.

Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 395.

Mup 390J - Applied Music: Jazz Studies (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.

Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 398.
Mup 390K- Applied Music: Clarinet (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.

Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 395.

## Mup 390L - Applied Music: Bassoon (1-4)

Junior year. Continuation of MuP 290. Maximum: 12 credits.

Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 395.

Mup 390M- Applied Music: Composition (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.

Prerequisite: MuP 290 and upper division examination.
Mup 3900 - Applied Music: Oboe (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.

Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 395.

Mup 390P - Applied Music: Piano (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.

Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 397.

Mup 390Q - Applied Music: Harp (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.

Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 397.
Mup 390S - Applied Music: Violin (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.

Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 396.
Mup 390T - Applied Music: Trumpet (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.

Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 395.

Mup 390U- Applied Music: Trombone (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.
Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 395.

Mup 390V - Applied Music: Voice (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.

Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 397.

Mup 390W - Applied Music: Tuba (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.

Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 395.

Mup 390X - Applied Music: Euphonium (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.

Prerequisite: MuP 290 and upper divis ion examination. Corequisite: Mus 395.
Mup 390Y - Applied Music: Viola (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.

Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 396.
Mup 390Z - Applied Music: Saxophone (1-4)
Junior year. Continuation of MuP 290. Maximum: 12 credits.
Prerequisite: MuP 290 and upper division examination. Corequisite: Mus 395.

Mup 490 - Applied Music (1-4)
Senior year. Continuation of Mup 390. Maximum: 12 credits.

Prerequisite: Mup 390 and audition.
Mup 490A - Applied Music: Trombone (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.
Prerequisite: MuP390 and audition. Corequisite: Mus 395.
Mup 490B - Applied Music: Bass (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.
Prerequisite: MuP390 and audition.
Mup 490C - Applied Music: Cello (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.
Prerequisite: MuP 390 and audition. Corequisite: Mus 396.
Mup 490D - Applied Music: Percussion (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.
Prerequisite: MuP 390 and audition. Corequisite: Mus 395.

Mup 490E- Applied Music: Early Instruments (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.
Prerequisite: MuP 390 and audition. Corequisite: Mus 397.
Mup 490F - Applied Music: French Horn (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.
Prerequisite: MuP 390 and audition. Corequisite: Mus 395.
Mup 490G - Applied Music: Guitar (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.
Prerequisite: MuP390 and audition. Corequisite: Mus 396.
Mup 490H- Applied Music: Harpsichord/Organ (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.

Mup 490I - Applied Music: Flute (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.

Prerequisite: MuP 390 and audition. Corequisite: Mus 395.
Mup 490J - Applied Music: Jazz Studies (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.

Prerequisite: MuP 390 and audition. Corequisite: Mus 398.
Mup 490K - Applied Music: Clarinet (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.

Prerequisite: MuP 390 and audition. Corequisite: Mus 395.
Mup 490L - Applied Music: Bassoon (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.

Prerequisite: MuP 390 and audition. Corequisite: Mus 395.
Mup 490M- Applied Music: Composition (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.

Prerequisite: MuP 390 and audition.
Mup 4900 - Applied Music: Oboe (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.

Prerequisite: MuP 390 and audition. Corequisite: Mus 395.

## Mup 490P - Applied Music: Piano (1-4)

Senior year. Continuation of MuP 390. Maximum: 12 credits.
Prerequisite: MuP 390 and audition. Corequisite: Mus 397.
Mup 490Q - Applied Music: Harp (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.

Prerequisite: MuP 390 and audition. Corequisite: Mus 397.
Mup 490S - Applied Music: Violin (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.

Prerequisite: MuP 390 and audition. Corequisite: Mus 396.
Mup 490T - Applied Music: Trumpet (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.
Prerequisite: MuP 390 and audition. Corequisite: Mus 395.
Mup 490U- Applied Music: Trombone (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.

Prerequisite: MuP 390 and audition. Corequisite: Mus 395.
Mup 490V - Applied Music: Voice (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.

Prerequisite: MuP 390 and audition. Corequisite: Mus 397.
Mup 490W - Applied Music: Tuba (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.

Prerequisite: MuP 390 and audition. Corequisite: Mus 395.
Mup 490X - Applied Music: Euphonium (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.

Prerequisite: MuP 390 and audition. Corequisite: Mus 395.

## Mup 490Y - Applied Music: Viola (1-4) <br> Senior year. Continuation of MuP 390. Maximum: 12 credits.

Prerequisite: MuP 390 and audition. Corequisite: Mus 396.
Mup 490Z - Applied Music: Saxophone (1-4)
Senior year. Continuation of MuP 390. Maximum: 12 credits.
Prerequisite: MuP 390 and audition. Corequisite: Mus 395.

## Mup 491 - Applied Music in Secondary Area (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band ins truments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

Also offered for graduate-level credit as Mup 591 and may be taken only once for credit.

## Mup 491B - Applied Music in Secondary Area: Baritone (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

## Mup 491 C - Applied Music in Secondary Area: Cello/Bass (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

## Mup 491D - Applied Music in Secondary Area: Percussion (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be as signed MuP 591.

## Mup 491F - Applied Music in Secondary Area: French Horn (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be as signed MuP 591.

## Mup 491G- Applied Music in Secondary Area: Guitar (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include thestudent's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be as signed MuP 591.

## Mup 491H- Applied Music in Secondary Area: Harpsichord/Organ (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band ins truments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

## Mup 491I- Applied Music in Secondary Area: Flute (12)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be as signed MuP 591.

## Mup 491J - Applied Music in Secondary Area: Jazz Studies (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

## Mup 491K- Applied Music in Secondary Area: Clarinet (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band ins truments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be as signed MuP 591.

## Mup 491L - Applied Music in Secondary Area: Bassoon (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be as signed MuP 591.

## Mup 4910 - Applied Music in Secondary Area: Oboe (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be as signed MuP 591.

## Mup 491P - Applied Music in Secondary Area: Piano (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be as signed MuP 591.

## Mup 491S - Applied Music in Secondary Area: Violin (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be as signed MuP 591.

## Mup 491T - Applied Music in Secondary Area: Trumpet (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

## Mup 491U- Applied Music in Secondary Area: Trombone/Tuba (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

## Mup 491V - Applied Music in Secondary Area: Voice (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band ins truments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

## Mup 491Y - Applied Music in Secondary Area: Viola (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band ins truments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be as signed MuP 591.

## Mup 491Z - Applied Music in Secondary Area: Saxophone (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be as signed MuP 591.

## Mup 590 - Applied Music (1-4)

Individual instruction in organ, piano, harpsichord, voice, guitar, conducting, and orchestral and band instruments. Maximum: 12 credits.
Prerequisite: audition.

## Mup 590A - Applied Music: Trombone (1-4)

Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.

Prerequisite: audition.

## Mup 590B - Applied Music: Bass (1-4)

Individual instruction in org an, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.
Prerequisite: audition.

## Mup 590C - Applied Music: Cello/Bass (1-4)

Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.

Prerequisite: audition.
Mup 590D - Applied Music: Percussion (1-4)
Individual instruction in org an, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.

Prerequisite: audition.
Mup 590E- Applied Music: Early Instruments (1-4)
Individual instruction in org an, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.
Prerequisite: audition.

## Mup 590F - Applied Music: French Horn (1-4)

Individual instruction in org an, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.
Prerequisite: audition.

## Mup 590G- Applied Music: Guitar (1-4)

Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.
Prerequisite: audition.
Mup 590H- Applied Music: Harpsichord/Organ (1-4)
Individual instruction in org an, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.

## Mup 590I- Applied Music: Flute (1-4)

Individual instruction in org an, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.

Prerequisite: audition.

## Mup 590J - Applied Music: Jazz Studies (1-4)

Individual instruction in org an, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.

Prerequisite: audition.

## Mup 590K- Applied Music: Clarinet (1-4)

Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.

Prerequisite: audition.

## Mup 590L-Applied Music: Bassoon (1-4)

Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.

Prerequisite: audition.

## Mup 590M- Applied Music: Composition (1-4)

Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.

Prerequisite: audition.

## Mup 5900 - Applied Music: Oboe (1-4)

Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.
Prerequisite: audition.

## Mup 590P - Applied Music: Piano (1-4)

Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.

Prerequisite: audition.

## Mup 590Q - Applied Music: Harp (1-4)

Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.

Prerequisite: audition.

## Mup 590S - Applied Music: Violin (1-4)

Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.

Prerequisite: audition.

## Mup 590T - Applied Music: Trumpet (1-4)

Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.

Prerequisite: audition.

## Mup 590U- Applied Music: Trombone (1-4)

Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.

Prerequisite: audition.
Mup 590V - Applied Music: Voice (1-4)
Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.

Prerequisite: audition.

## Mup 590W - Applied Music: Tuba (1-4)

Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.

Prerequisite: audition.

## Mup 590X - Applied Music: Euphonium (1-4)

Individual instruction in org an, piano, harp sichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.

Prerequisite: audition.

## Mup 590Y - Applied Music: Viola (1-4)

Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.

Prerequisite: audition.

## Mup 590Z-Applied Music: Saxophone (1-4)

Individual instruction in organ, piano, harpsichord, voice, guitar, and orchestral and band instruments. Maximum: 12 credits.

Prerequisite: audition.
Mup 591 - Applied Music in Secondary Area (1-2)
Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing Mup 590 audition will be assigned Mup 591.
Also offered for undergraduate-level credit as Mup 491 and may be taken only once for credit.

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Mup 591A - Applied Music in Secondary Area: Trombone (1-2)
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Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools.

Graduate students not passing MuP 590 audition will be assigned MuP 591.

## Mup 591B - Applied Music in Secondary Area: Baritone (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

## Mup 591C - Applied Music in Secondary Area: Cello/Bass (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include thestudent's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

## Mup 591D - Applied Music in Secondary Area: Percussion (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

## Mup 591F - Applied Music in Secondary Area: French Horn (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include thestudent's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be as signed MuP 591.

## Mup 591G-Applied Music in Secondary Area: Guitar (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be as signed MuP 591.

## Mup 591 H - Applied Music in Secondary Area: Harpsichord/Organ (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be as signed MuP 591.

## Mup 591I- Applied Music in Secondary Area: Flute (12)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be as signed MuP 591.

## Mup 591J - Applied Music inSecondary Area: Jazz Studies (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

## Mup 591K- Applied Music in Secondary Area: Clarinet (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be as signed MuP 591.

## Mup 591L - Applied Music in Secondary Area: Bassoon(1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be as signed MuP 591.

## Mup 5910 - Applied Music in Secondary Area: Oboe (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include thestudent's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be assigned MuP 591.

## Mup 591P - Applied Music in Secondary Area: Piano (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be as signed MuP 591.

## Mup 591S - Applied Music in Secondary Area: Violin (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be as signed MuP 591.

## Mup 591T - Applied Music in Secondary Area: Trumpet (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band ins truments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be as signed MuP 591.

## Mup 591U- Applied Music in Secondary Area: Trombone/Tuba (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band ins truments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be as signed MuP 591.

## Mup 591 V - Applied Music in Secondary Area: Voice (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be as signed MuP 591.

## Mup 591 Y - Applied Music in Secondary Area: Viola (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be as signed MuP 591.

## Mup 591Z-Applied Music in Secondary Area: Saxophone (1-2)

Private instruction in voice, keyboard, guitar, and orchestral or band instruments, not to include the student's major performance area in order to extend the performance skills of the music specialist in the public schools. Graduate students not passing MuP 590 audition will be as signed MuP 591.

## Mus - Music

## Mus 047 - Final Project (0)

All Bachelor of Arts and Bachelor of Science degree candidates must complete a final project consisting of one of the following: (1) a half recital, (2) a performance project, (3) regular performances on area recitals.

## Mus 056 - Graduate Music History Entrance Exam (0)

The Graduate Entrance Examination in history is a diagnostic test designed to assess entering graduate students' knowledge of music history as presented in traditional undergraduate his tory sequences. Students are expected to have a basic knowledge of genres, composers, compositions, and musical styles from the Middle Ages through the Twentieth Century. The examination will include questions, listening examples and score excerpts from all musical periods. Students who do not pass the exam will be required to take and pass Mus 529 Graduate History Review, before registering for any advanced graduate music his tory courses. The examis given in June and September of each year. Contact theSchool of Music \& Theater for more information about specific times.

## Mus 057 - Graduate Music Theory Entrance Exam (0)

The Graduate Entrance Examination in theory is a diagnostic test designed to as sess entering graduate students' knowledge of music theory as presented in traditional undergraduate theory sequences. Students are expected to have a basic knowledge of aural dictation, analys is and Seventeenth Century voice leading. The examination will include harmonic analysis fromthe Baroque through Romantic periods. Students who do not pass the examwill be required to take and pass Mus 512 Graduate Theory Review, before registering for any advanced graduate music theory courses. The examis given in June and September of each year. Contact the School of Music \& Theater for more information about specific times.

## Mus 101 - Contemporary Music Theory I (4)

Music theory relevant to contemporary musical styles. Explores notation, pitch, rhythm, meter, tonality, intervals, chords, lead sheet notation, and diatonic harmony. Includes basic ear training, sight singing, and rhythmic skills. Requires no previous musical experience. This is the first course in a sequenceof three: Mus 101, Mus 102, and Mus 103 and must be taken in sequence.

## Mus 102 - Contemporary Music Theory II (4)

Music theory relevant to contemporary musical styles. Explores harmonic function, roman numeral analysis, 12barblues, non-chord tones, asymmetrical meter, and modes. Includes basic eartraining, sightsinging, and rhythmic skills. This is the second course in a sequence of three: Mus 101, Mus 102, and Mus 103 and must be taken in sequence.
Prerequisite: Mus 101 or permission of instructor.

## Mus 103 - Contemporary Music Theory III (4)

Music theory relevant to contemporary musical styles. Explores chromatic harmony, chord extensions, and song forms through analysis, composition, and improvisation. Includes basic ear training, sights singing, and rhythmic skills. This is the third course in a sequence of three: Mus 101, Mus 102, and Mus 103 and must be taken in sequence.
Prerequisite: Mus 102 or permission of instructor.

## Mus 105 - Introduction to Music Theory (3)

Preparatory level of music theory introducing main terms and concepts: music notation, meter, beat, rhythm, intervals, circle of fifth, key signatures, major and minor scales, triads and dominant seventh chord, and their implementation in blues formand popular song. No
previous musical knowledge required. Complements PracticalMusicianship.

## Mus 106 - Aural Skills (3)

Designed to train the student to aurally recognize meters, rhythms, intervals, triads and seventh chords. Students learn to sing melodies on sight as well as develop strategies for composing and harmonizing melodies for instrumental or vocal accompaniment.

## Mus 111 - Music Theory I (3)

Provides a thorough ground-work in the melodic, harmonic, and rhythmic elements of music with written exercises and analysis based on the styles of Bach, Haydn, Mozart, Beethoven, and other 17th and 18th century composers. Registration in the appropriateSightSinging/Ear Training course is required. An entrance placement examination will be given. Basic Keyboard Skills is recommended formusic majors and minors. This is the first course in a sequence of three: Mus 111, Mus 112, and Mus 113.

## Mus 112 - Music Theory II (3)

Provides a thorough ground-work in the melodic, harmonic, and rhythmic elements of music with written exercises and analysis based on the styles of Bach, Haydn, Mozart, Beethoven, and other 17th and 18th century composers. Registration in the appropriateSightSinging/EarTraining course is required. An entrance placement examination will be given. Basic Keyboard Skills is recommended for music majors and minors. This is the second course in a sequence of three: Mus 111, Mus 112, and Mus 113.

## Mus 113-Music Theory III (3)

Provides a thorough ground-work in the melodic, harmonic, and rhythmic elements of music with written exercises and analysis based on the styles of Bach, Haydn, Mozart, Beethoven, and other 17th and 18th century composers. Registration in the appropriateSightSinging/EarTraining course is required. An entrance placement examination will be given. Basic Keyboard Skills is recommended formusic majors and minors. This is the third course in a sequence of three: Mus 111, Mus 112, and Mus 113.

## Mus 114-Sight Singing/Ear Training I(1)

Studies to develop the ability to sing notation at sight and to recognize and notate aural patterns. Registration in the
appropriate Music Theory I course is required. This is the first course in a sequenceof three: Mus 114, Mus 115, Mus 116.

## Mus 115-Sight Singing/Ear Training II (1)

Studies to develop the ability to sing notation at sight and to recognize and notate aural patterns. Regis tration in the appropriate Music Theory course is required. This is the second course in a sequence of three: Mus 114, Mus 115, Mus 116.

## Mus 116 -Sight Singing/Ear Training III (1)

Studies to develop the ability to sing not ation at sight and to recognize and notate aural patterns. Registration in the appropriate Music Theory course is required. This is the third course in a sequence of three: Mus 114, Mus 115, Mus 116.

## Mus 129 -DesktopMusic Production (4)

Provides students with the necessary skills and techniques to produceCDquality music using modern music technology. Students will learn to record and edit audio from a variety of sources, processing and effects, MIDI and Podcasting.

## Mus 145 -Music Technology Lab (1)

Introduction to the practical skills of navigating a recording studio, live recording set-up, and amplified music context. Basic music and audio production skills are presented. Some peripheral is sues, including acoustics, software and hardware operation, mixing and archiving, ses sion management are addressed. This is a repeatable, required course in the PSU Sonic Arts and Music Production program.

## Mus 174 - Introduction to Music Technology (3)

A hands-on introduction to the basic concepts, equipment, and software involved in modern music production. Covers introduction to MIDI sequencing, analog and digital audio, and basic studio techniques.

## Mus 187 - Yoga, Relaxation and Flexibility for Musicians (1)

A course for musicians that incorporates gentle stretching, mild postures, breathing and relaxation techniques. Class participants will be guided through activities drawn from the disciplines of yoga, Tai Chi, and general flexibility and
relaxation exercises. There are no prerequisites forthis class. Equipment required: yoga mat and strap. Optional equipment: yoga block.

## Mus 188 - Performance Attendance (0)

The student is expected to attend a minimum of eight live performances approved by the School of Music \& Theater for each termregistered. It is expected that students will register for Performance Attendance concurrently with registration for Applied Music.

## Mus 189 - Repertoire Study (1)

Study and performance of selected repertoire. Av ailable only to students enrolled in large ensemble, chamber mu sic or applied music.

Prerequisite: consent of instructor.

## Mus 191 - Group Lessons for Beginners I: Piano, Guitar or Voice (2)

Class instruction in instruments or voice. Offerings include piano, guitar, and voice. Music majors in Mus 193 Class Piano should be enrolled in Mus 046 concurrently. This is the first course in a sequence of three: Mus 191, Mus 192, and Mus 193.

## Mus 192 - Group Lessons for Beginners II: Piano, Guitar or Voice (2)

Class instruction in instruments or voice. Offerings include piano, guitar, and voice. Music majors in Mus 193 Class Piano should be enrolled in Mus 046 concurrently. This is the second course in a sequence of three: Mus 191, Mus 192, and Mus 193.

Mus 193 - Group Lessons for Beginners III: Piano, Guitar or Voice (2)
Class instruction in instruments or voice. Offerings include piano, guitar, and voice. Music majors in Mus 193 Class Piano should be enrolled in Mus 046 concurrently. This is the third course in a sequence of three: Mus 191, Mus 192, and Mus 193.

## Mus 194-Chamber Music (1)

Instruction in the art of small ensemble performance; the established repertory of string, wind, keyboard, or vocal chamber music. Maximum: 6 credits. Audition may be requested.
Prerequisite: consent of instructor.

Mus 195 - Band (1)
Maximum: 6 credits. Audition may be requested.

## Mus 196-Orchestra (1)

Maximum: 6 credits. Audition may be requested.

## Mus 197 - Chorus (1)

Maximum: 6 credits. Audition may be requested.

## Mus 198 - Jazz Lab Band (1)

Performance of jazz literature in a big bandsetting. Maximum: 6 credits. Audition may be requested.

## Mus 199 -Special Studies (1-4)

(Credit to be arranged.)

## Mus 200-Musical Instruments (4)

Study of the conventional clas sification, his tory, construction, and the use of instruments in classical, folk, and popular music. Instruments are explored in terms of: manner of producing sound, tuning and transposing, technical capabilities, virtuosity, and compatibility with other instruments/vocal parts as demonstrated in the literature. Develops aural recognition of each ins trument.

## Mus 201 - Introduction to Music (4)

Designed for non-majors. Course involves lectures, reading, and listening. Course may emphasize music of different world cultures. Successively the course deals with elements of music and small forms (201), and large forms of music and categories of musical literature (202). This is the first course in a sequence of two: Mus 201 and Mus 202.

## Mus 202 - Introduction to Music (4)

Designed for non-majors. Course involves lectures, reading, and listening. Course may emphasize music of different world cultures. Successively thecourse deals with elements of music and small forms (201), and large forms of music and categories of musical literature (202). This is the second course in a sequence of two: Mus 201 and Mus 202.

Mus 203-Music in the Western World (4)
Designed for music majors and others with the ability to read music. Introduction to the great composers and their compositions within a historical framework.

## Mus 204 - Body Mapping for Musicians (2)

Anatomical information about the body in movement for musicians. Topics include sensory awareness, inclusive awareness, standing and sitting at balance, skeletal anatomy of the arms and legs, the structures and movements of breathing, hearing loss prevention, and performance anxiety.
Prerequisite: At least one year of experience as a singer or instrumentalist.

## Mus 205-Listening I(1)

Online listening survey of the major works within various musicaltraditions, including Western art music, Jazz, American music, and World music. This is the first course in a sequence of two: Mus 205 and Mus 206.

## Mus 206 - Listening II (1)

Online listening survey of the major works within various musicaltraditions, including Western art music, Jazz, American music, and World music. This is the second course in a sequence of two: Mus 205 and Mus 206.

## Mus 211 - Music Theory IV (3)

Continuation of the study of harmony. Introduction to harmonic counterpoint. Composition in small forms in various 18th, 19th, and 20th century idioms. Regis tration in the appropriate Sight-Singing/Ear Training course is required. This is the first course in a sequence of three: Mus 211, Mus 212, and Mus 213.
Prerequisite: Mus 046, Mus 113, and Mus 116.

## Mus 212-Music Theory V (3)

Continuation of the study of harmony. Introduction to harmonic counterpoint. Composition in small forms in various 18th, 19th, and 20th century idioms. Registration in the appropriate Sight-Singing/Ear Training course is required. This is the second course in a sequence of three: Mus 211, Mus 212, and Mus 213.
Prerequisite: Mus 046, Mus 113, and Mus 116.

## Mus 213-Music Theory VI (3)

Continuation of the study of harmony. Introduction to harmonic counterpoint. Composition in small forms in various 18th, 19th, and 20th century idioms. Regis tration in the appropriate Sight-Singing/Ear Training course is
required. This is the third course in a sequence of three: Mus 211, Mus 212, and Mus 213.

Prerequisite: Mus 046, Mus 113, and Mus 116.
Mus 214 -Sight Singing/Ear Training IV (1)
Continuation of the study of sight-singing and ear training at an advanced level. Ability to sing notation at sight and to recognize and notate aural patterns. Registration in the appropriate Music Theory course is required. This is the first course in a sequenceof three: Mus 214, Mus 215, and Mus 216.

Prerequisite: Mus 113 and Mus 116.

## Mus 215 -Sight Singing/ Ear Training V (1)

Continuation of the study of sight-singing and ear training at an advanced level. Ability to sing notation at sight and to recognize and notate aural patterns. Registration in the appropriate Music Theory course is required. This is the second course in a sequence of three: Mus 214, Mus 215, and Mus 216.

Prerequisite: Mus 113 and Mus 116.

## Mus 216-Sight Singing/Ear Training VI(1)

Continuation of the study of sight-singing and ear training at an advanced level. Ability to sing notation at sight and to recognize and notate aural patterns. Registration in the appropriate Music Theory course is required. This is the third coursein a sequence of three: Mus 214, Mus 215, and Mus 216.

Prerequisite: Mus 113 and Mus 116.
Mus 224 - Wellness for Musicians (2)
Designed to introduce students to a wide range of healthrelated topics including diet, exercise, sleep, meditation, stress management and injury prevention. Lectures, lab activities, and guest speakers will all be utilized. Students will learn how to improve their health and well-being.

## Mus 228 -S ound Design (4)

Up-to-date introduction to the art of sound synthesis and sampling with special emphasis on today's technology and the evolving market place. Comprehensive overview of specific techniques for creating new sounds, capturing and manipulating existing sounds and application.

Mus 231 -Survey of Popular Music Since 1950 (4)
Informs students of musical, his torical and social as pects of American popular music since 1950. Genres explored include rhythmand blues, country and western, rock and roll, punk, heavy metal and hip-hop.

## Mus 232 - Music and Style (4)

Focus on analysis of the inner workings of the nine selected compositions that marked the development of musicalform and overall period style. Study of fugue, character piece, symphony, chamber forms, opera, and musical, and programand absolute music. Each week brings one significantpiece.

## Mus 233 - Music Notation (4)

Provides students with thorough study in the principles of music notation, providing a comprehensive overview of specific techniques forcreating music manuscripts that are not only correct in terms of notation, but legibly written and clearly communicating the composers' intentions.

## Mus 236 - Wind and Percussion Instruments (1)

A study of the wind and percussion instruments of the orchestra and band for students in the teacher education program.

## Mus 240-Composition I (2)

The course involves the study of 20th century composition techniques. Students will compose chamber works using techniques studied in the class. This is the first course in a sequence of three: Mus 240, Mus 241, and Mus 242 which must be taken in sequence.

Prerequisite: Mus 113 and Mus 116.
Mus 241 - Composition II (2)
The course involves the study of 20th century composition techniques. Students will compose chamber works using techniques studied in the class. This is the second course in a sequence of three: Mus 240, Mus 241, and Mus 242 which must be taken in sequence.
Prerequisite: Mus 113 and Mus 116.

## Mus 242-Composition III (2)

The course involves the study of 20th century composition techniques. Students will compose chamber works using techniques studied in the class. This is the third course in a sequence of three: Mus 240, Mus 241, and Mus 242 which must be taken in sequence.
Prerequisite: Mus 113 and Mus 116.
Mus 245 - SAMP I: Audio Recording (3)
Thorough study of digital audio recording and the signal chain from theoretical, technical, and practical perspectives. Students will learn the practical skills of an audio technician through live recording of sounds, musical instruments, and human voices. Topics include digital
audio theory; microphone properties, applications, and ideal placements; and tools and techniques used to acquire robustand clear documentation of sound.

## Mus 246 -SAMP II: Studio Techniques (3)

Foundational study of the concepts and techniques used in commercial music production. This class will introduce multi-tack digital audio recording, editing, mixing and signal processing. Topics will include MIDI music making with virtual instrument plug-ins, synthesis and sampling technologies.
Prerequisite: Mus 245.

## Mus 247 -SAMP III: Studio Production (3)

Recording and producing song-length musical products. Utilizing a series of increasingly complexassignments, students will work through the music production process from inception to distribution. The course includes an examination of the commercial music production business.

Prerequisite: Mus 246.

## Mus 261 - History of Rock Music (4)

Traces the history and development of a popular music style in the United States, Great Britain, and other parts of the world. Includes othertypes of popular music in the twentieth century. This is the first course in a sequence of two: Mus 261 and Mus 262.

## Mus 262 - History of Rock Music (4)

Traces the history and development of a popular music style in the United States, Great Britain, and other parts of the world. Includes othertypes of popular music in the twentieth century. This is the second course in a sequence of two: Mus 261 and Mus 262.

## Mus 271 - Jazz Improvisation I (2)

Introduces the fundamentals of jazz improvis ation. Beginning jazzskills include scales, song forms, melodic patterns, and repertoire development. Ins tructor approval required. This is the first course in a sequence of three: Mus 271, Mus 272, and Mus 273.

## Mus 272-Jazz Improvisation II (2)

Introduces the fundamentals of jazz improvisation. Beginning jazzs kills include scales, song forms, melodic patterns, and repertoire development. Ins tructor approval required. This is the second course in a sequence of three: Mus 271, Mus 272, and Mus 273.

## Mus 273 - Jazz Improvisation III (2)

Introduces the fundamentals of jazz improv is ation. Beginning jazzskills include scales, song forms, melodic patterns, and repertoire development. Instructor approval required. This is the third course in a sequence of three: Mus 271, Mus 272, and Mus 273.

## Mus 274 - Introduction to WorldMusic (4)

Provides an insight into the abundanceof trends called World Music. Explains what is considered world music and what is not. With a very broad approach, material samples every corner of the world through representative traditions, performing styles and instruments of different nations.

## Mus 291 - Advanced Class Piano I (2)

Advanced class instruction developing functional piano skills. Activities include performing scales, chords, and progressions in all keys. Students develop harmonization, sight reading, and improvisation skills. They perform simple piano pieces and accompaniments. Assessment by the instructor determines whether students are admitted, or should take basic Class Piano first. This is the first course in a sequence of three: Mus 291, Mus 292, and Mus 293.

## Mus 292 - Advanced Class Piano II (2)

Advanced class instruction developing functional piano skills. Activities include performing scales, chords, and progressions in all keys. Students develop harmonization, sight reading, and improvisation skills. They perform simple piano pieces and accompaniments. Assessment by the instructor determines whether students are admitted, or should take basic Class Piano first. This is the second course in a sequence of three: Mus 291, Mus 292, and Mus 293.

## Mus 293 - Advanced Class PianoIII (2)

Advanced class instruction developing functional piano skills. Activities include performing scales, chords, and progressions in all keys. Students develop harmonization, sight reading, and improvisation skills. They perform simple piano pieces and accompaniments. Assessment by the instructor determines whether students are admitted, or should take basic Class Piano first. This is the third course in a sequence of three: Mus 291, Mus 292, and Mus 293.

## Mus 301U-Survey of Music Literature I: Medieval to Classical Era (4)

For non-majors or majors; the study music history by examining the literature of particular time periods. Mus 301U: Music fromthe Medieval to Classical Era; Mus 302U: Music fromthe Romantic to Modern Era. This is the first course in a sequenceof two: Mus 301U and Mus 302U.

## Mus 302U- Survey of Music Literature II: Romantic to Modern Era (4)

For non-majors or majors; the study music history by examining the literature of particular time periods. Mus 301U: Music fromthe Medieval to Classical Era; Mus 302U: Music fromthe Romantic to Modern Era. This is the second course in a sequence of two: Mus 301U and Mus 302U.

## Mus 304 -Music History: Medieval, Renaissance, and Baroque (4)

Intensive analytical study of the history of music in the Medieval, Renaissance, and Baroque Periods (Mus 304), Classical and Romantic Periods (Mus 305) and 20th Century Period (Mus 306). This is the first course in a sequence of three: Mus 304, Mus 305, and Mus 306.
Prerequisite: Mus 205 and Mus 206.
Mus 305 -Music History: Classical and Romantic (4)
Intensive analytical study of the history of music in the Medieval, Renaissance, and Baroque Periods (Mus 304), Classical and Romantic Periods (Mus 305) and 20th Century Period (Mus 306). This is the second course in a sequence of three: Mus 304, Mus 305, and Mus 306.

Prerequisite: Mus 205 and Mus 206.

## Mus 306 -Music History: 20th Century (4)

Intensive analytical study of the history of music in the Medieval, Renaissance, and Baroque Periods (Mus 304), Classical and Romantic Periods (Mus 305) and 20th Century Period (Mus 306). This is the third course in a sequence of three: Mus 304, Mus 305, and Mus 306.
Prerequisite: Mus 205 and Mus 206.
Mus 311 -Formal Analysis (3)
Thorough study of formal analys is, including phrases and periods, variations, two- and three-part song forms, developedternary forms, sonata, rondo, and the concerto.
Prerequisite: Mus 213.

## Mus 312 - Orchestration (3)

Fundamentals of arranging music for instrumental ensembles. Emphas is on basic principles of orchestration and their practicalapplications.
Prerequisite: Mus 213. Counterpoint (3) Intensive study of polyphonic music. Analysis and application in writing contrapuntal exercises using two, three, and four voices. Prerequisites:Mus 213.
Mus 313 - Counterpoint (3)
Intensive study of polyphonic music. Analysis and application in writing contrapuntalexercises using two, three, and four voices.
Prerequisite: Mus 213.

## Mus 320 - Fundamentals of Conducting (2)

The basic principles of conducting as they apply to both instrumental and vocal ensembles. Basic batontechnique and beat patterns. Development of an independent use of the hands. Fundamentals of score reading, both instrumental and vocal.
Prerequisite:Mus 213.

## Mus 321 - Instrumental Conducting (2)

The principles of conducting and training instrumental organizations.
Prerequisite: Mus 320.

## Mus 322 - Choral Conducting (2)

The principles of conducting and training choral organizations.
Prerequisite: Mus 320.

## Mus 344 - Sonic Arts and Music Production Laptop Ensemble (1)

An ensemble of humans, laptops, controllers, and speakers. Ensemble members both compose and performin the ensemble, exploring computer-mediated instrument design, sound synthesis, programming, live interactive performance, and incorporation of vis ual media. Explorations culminate in public performance. May be repeated for up to a maximum of six credits.
Prerequisite: Mus 247 or permis sion of instructor.
Mus 345 -SAMP IV: Acoustics for Musicians (3)
Study of acoustics as it pertains to the performing musician, audio recording technician, and sound artist. Topics include sound wave production, propagation and dissipation; practical use of the decibel scale; spectral qualities of sounds; psychoacoustics; and acoustic treatment considerations for recording studios and performance spaces.

Prerequisite: Mus 247.

## Mus 346 -SAMP V: Music with Visual Media (3)

Examines music and sound designcreated to support the visual image. Topics include film scoring technology and technique, creating and editing dialogue and sound effects, working with animation, interfacing with film editors, and the film and video audio post-production business.
Prerequisite: Mus 247 and Mus 345.
Mus 347 -SAMPVI: Integrated Sound Arts (3)
Incorporates recording techniques, studio production, visual media, sound design, electronic composition, and live interactive performance. Introduces new contexts including iOS, cloud-based music collaboration, DIY electronic instrument building, and live interactive installations using sensor-based technology. Students complete creative projects in collaboration with community partners in the arts or business world.
Prerequisite: Mus 346 or permission of instructor.

## Mus 351 - Accompanying (2)

Theoretical and practical study of the art of accompanying vocal and instrumental solos and performing duo-sonatas. This course is repeatable up to 6 times for credit.

## Mus 355U- Jazz History (4)

Examines the development of jazz from its African and European roots and its origins in New Orleans to its florescence in Chicago and New York. Covers period from about 1900 to 1960. Focuses on important musicians and major musical styles.

## Mus 356U- Jazz And American Culture: How History Shaped Our Music, Then and Now (4)

Examines jazz and its development in the context of American history. Jazz, pre-jazz, contemporary practice, and related sub-genres will be explored through listening and analysis. The cultural context from which the music emerged will be dis sected and discussed. Covers period from the mid-1800s to today.

## Mus 360U- The Guitar: its History and Music (4)

This course is designed to explore the origins of the guitar by examining its history, repertoire and performers. The course will look at all aspects of the guitar's his tory from the related ancient Sumerian stringed ins truments to the modern-day electric guitar.

Mus 361U - History of Rock Music I (1950-1970) (4)
Traces the history and development of a popularmusic style in the United States, Great Britain, and other parts of the world from 1950 to 1970. Includes othertypes of popular music in the twentieth century. This is the first course in a sequence of two: Mus 361 and Mus 362 .

## Mus 362U-History of Rock Music II (1970-Present) (4)

Traces the history and development of a popular music style in the United States, Great Britain, and other parts of the world since 1970. Includes other types of popular music in the twentieth century. This is the second course in a sequence of two: Mus 361 and Mus 362 .

## Mus 363U- The Music of the Beatles (4)

Study of the development of the Beatles' mus ic fromthe late 1950's through the early 1970's. Students will gain a deeperunderstanding of the music through elementary musical analysis of form, harmony, and recording studio techniques. The cultural context from which their music emerged and theirsignificant influence on popular culture will be examined.

## Mus 364U- Modern Music Technology (4)

An in-depth examination of digital technologies used for creating and distributing music, and the social impact of these technologies.

## Mus 365U- Film Music (4)

An aesthetic, his torical, commercial, and technical examination of the role of music and sound design within the art of film.

## Mus 366U- New Orleans: Jazz andCulture in the Storyville Era (4)

Examines the music of New Orleans during the Storyville era of early 20thcentury, and its place in the broader context of American popular music history. Students explore the historical narrative surrounding popular music, culture, and identity, as it emerged in New Orleans.

## Mus 367U- The Music of Nashville: From Honky Tonk to Hip-Hop (4)

Examines the music of Nashville, and its place in the broader context of American popular music his tory. Students will explore the historical narrative surrounding popular music, culture, and identity as it emerged in

Nashville, Music City USA. Students will trace the city's country music origins and later developments to include indie, hip-hop, pop, and soul.

## Mus 368U- Motown: Detroit's History and Music (4)

Examines the music of Motown, and its place in the broader context of American popular music history. Students will explore the historical narrative surrounding popular music, culture, and identity as it emerged in Detroit, the city of Motown's origin.

## Mus 369U- Music and Social Change (4)

Examines the connection between music and social/politicalmovements in the United States, with specialemphasis on the tumultuous social, economic, and political challenges of the 20th Century. Students will identify the music of social change, its relationship with history, diversity, and social justice, and its place in the broader context of American Studies.

Mus 374U- World Music: Africaand the Middle East (4)

Study of the major musical cultures of Africa and the Middle East. Explores social and cultural contexts, instrument types, and structural organization of the music. Emphasis on listening. This is the first course in a sequence of two, Mus 374U: Africa and Mus 375U: Asia.

## Mus 375U- World Music: Asia (4)

Study of the major musical cultures of Asia, examined through its unique regions. Explores social and cultural contexts, instrument types, and structural organization of the music. Emphas is on listening. This is the second course in a sequence of two, Mus 374U: Africa and the Middle East, and Mus 375U: Asia.

## Mus 376U-American Musical Traditions (4)

Examines the diversity of musical traditions found in American history and culture. Included are African American, Anglo- American, Hispanic, and NativeAmerican musical cultures, in the are as of folk, popular, and classical music genres.

## Mus 377U- World Music: Latin America and the Caribbean (4)

The course presents Latin American musical genres and forms: bolero, bossa nova, choro, rumba, salsa, samba,
tango, Latin pop. Against the backdrop of each country's historical circumstances, music and social dancing are used as an entry point to understanding political events, cultural trends, and a makeup of Latino cultural identities.

## Mus 381 - Music for Elementary Teachers (4)

Musical skills and concepts for the elementary classroom teacher. Integration projects focus on deeper learning through musical experiences.

## Mus 389 - Repertoire Study (1)

Study and performance of selected repertoire. Available only to students enrolled in large ensemble, chamber music or applied music.

Prerequisite: consent of instructor.

## Mus 394-Chamber Music (1)

Instruction in the art of small ensemble performance; the established repertory of string, wind, keyboard, or vocal chamber music. Maximum: 6 credits.
Prerequisite: consent of instructor.
Mus 395 - Band (1)
Maximum: 6 credits. Audition may be requested.

## Mus 396-Orchestra(1)

Maximum: 6 credits. Audition may be requested.

## Mus 397 - Chorus (1)

Maximum: 6 credits. Audition may be requested.

Mus 398 - Jazz Lab Band (1)
Performance of jazz literature in a big band setting. Maximum: 6 credits. Audition may be requested.

## Mus 399 - Special Studies (1-6)

(Credit to be arranged.)

## Mus 401 - Research (1-6)

(Credit to be arranged.) Consent of instructor.

Mus 402 - Independent Study (1-12)
(Credit to be arranged.)

## Mus 404 -Cooperative Education/Internship (1-12)

(Credit to be arranged.)

## Mus 405 -Reading and Conference (1-6)

(Credit to be arranged.) Consent of instructor.

## Mus 406 -Special Projects (1-12)

(Credit to be arranged.)

## Mus 407-Seminar (1-6)

(Credit to be arranged.) Consent of instructor. Recent topics have included Style Analysis; Style Criticism; Music History;Music in the Elementary School; Seminar in Composition.

Mus 408 - Workshop(0-6)
(Credit to be arranged.)

## Mus 409-Practicum(1-12)

(Credit to be arranged.)

## Mus 410 -Selected Topics (1-6)

(Credit to be arranged.)

## Mus 421 -Analysis of Contemporary Music (3)

Thorough study of compositional techniques and structural devices used in contemporary art music. Topics include formal, harmonic, and rhythmic as pects of the music. Impres sionism, serialism, set theory, indeterminacy and minimalis $m$ are addressed. The focus is on post-tonal music.
Also offered for graduate-level credit as Mus 521 and may be taken only once forcredit. .Prerequisite: Mus 211, Mus 212, Mus 213.

## Mus 422 -Analytical Techniques (3)

Study of the formal structure of musical compositions of various styles with the purpose of discovering the sources of unity, variety, order, and expres sion present in them.
Prerequisite: Mus 311.

## Mus $\mathbf{4 2 4}$ - Ins trumental Jazz Arranging I(2)

In-depth study and application of the fundamentals of composing and arranging fors mall to large jazz ensembles. Subjects included are his tory, transposition, instruments, forms, harmonic and melodic construction, rhythmsection, voicing, moving harmonization, score and part preparation, vocal arranging techniques, rehearsal techniques, and MIDI applications. Instructor approval required. This is the first course in a sequence of three: Mus 424, Mus 425, and Mus 426.
Also offered for graduate-level credit as Mus 524 and may be taken only once for credit. . Prerequisite: Upperdivision standing.

## Mus $\mathbf{4 2 5}$ - Instrumental Jazz Arranging II (2)

In-depth study and application of the fundamentals of composing and arranging for s mall to large jazz ensembles. Subjects included are history, transposition, instruments, forms, harmonic and melodic construction, rhythmsection, voicing, moving harmonization, score and part preparation, vocal arranging techniques, rehearsal techniques, and MIDI applications. Instructor approval required. This is the second course in a sequence of three: Mus 424, Mus 425, and Mus 426.

Also offered for graduate-level credit as Mus 525 and may be taken only once for credit. . Cross-Listed as: Upperdivision standing.

## Mus 426 - Instrumental Jazz Arranging III (2)

In-depth study and application of the fundamentals of composing and arranging for s mall to large jazz ensembles. Subjects included are history, transposition, instruments, forms, harmonic and melodic construction, rhythmsection, voicing, moving harmonization, score and part preparation, vocal arranging techniques, rehearsal techniques, and MIDI applications. Instructor approval required. This is the third course in a sequence of three: Mus 424, Mus 425 , and Mus 426.

Also offered for graduate-level credit as Mus 526 and may be taken only once for credit. .Prerequisite: Upperdivision standing.

## Mus 427 - Opera Workshop (1)

A workshop in preparing and performing operatic literature for advanced singers.
Also offered for graduate-level credit as Mus 527 and may be taken only once for credit. .Prerequisite: consent of instructor through audition.

## Mus 428 - Opera Production (1-2)

Annual production of a major operatic work. Designed for singers, orchestral instrumentalists, and technical support staff in the areas of costuming, set design, and otherareas.

Casting for production is by audition during winter quarter. This course may be repeated credit.
Also offered for graduate-level credit as Mus 528.
Mus 430 -Song Literature (3)
Study of the solo literature for voice through analysis of scores and recordings and live performances. Historical perspectives fromElizabethan song to 20th-century art songs. Also offere for graduate-level credit as Mus 530 and may be taken only once for credit.
Prerequisite: Mus 304, Mus 305, Mus 306.
Mus 431 - Chamber Music Literature (3)
Historical survey of the music associated with the chamber music repertoire from 1600-1950. Emphasis on analysis of scores and recordings.
Also offered for graduate-level credit as Mus 531 and may be taken only once for credit. .Prerequisite: Mus 304, Mus 305, Mus 306.

## Mus 432 - Band Wind Literature (3)

A study of literature for ensembles of wind and wind/percussion instruments fromabout 1600 to the present. Historical pers pective will be gained through reading, style-analysis, and listening. Attention will be given to the practical application of band literature in elementary and secondary teaching situations.
Also offered for graduate-level credit as Mus 532 and may be taken only once for credit. . Prerequisite: Mus 304, Mus 305, Mus 306.

## Mus 433 - Orchestral Literature (3)

A historicalsurvey of the music associated with the symphony orchestra from the development of each orchestral instrument to the present day. Intensive study of those works of great significance is achieved through score study and analysis of several interpretations through recordings. Attention will be given to the practical application of orchestral literature in elementary and secondary teaching situations.
Also offered for graduate-level credit as Mus 533 and may be taken only once forcredit. . Prerequisite: Mus 304, Mus 305, Mus 306.

## Mus 434 - Choral Literature I (3)

The objective of this course is to develop an understanding of the depth and breadth of choral music written fromthe Middle Ages to the Clas sical era. The course will examine representative literature fromthese eras, and will help each student to establis h more thorough knowledge of the repertoire, as they work towards diverse and innovative programming in their eventual choral conducting careers.

Also offered for graduate-level credit as Mus 534 and may be taken only once for credit. . Prerequisite: Mus 304, Mus 305, Mus 306.

## Mus 435-Choral Literature II (3)

The objective of this course is to develop an understanding of the depth andbreadth of choral music written fromthe Romantic Period to the Present Day. The course will examine representative literature fromthese eras, and will help each student to establish a more thorough knowledge of the repertoire, as they work towards diverse and innovative programming in their eventual choral conducting careers.
Also offered for graduate-level credit as Mus 535 and may be taken only once for credit. Prerequisite: Upperdivision standing.

## Mus 436 - Opera Literature (3)

An intensive study of the development of opera in western music, from the works of Monteverdi in the early 17 th century to the important operas of this century.
Also offered for graduate-level credit as Mus 536 and may be taken only once for credit. . Prerequisite: Mus 304, Mus 305, Mus 306.

## Mus 437 - Keyboard Literature I (3)

A study of Baroque and Clas sical literature for keyboard instruments. In addition to providing an overview of the historical development of keyboard music, specific works from the repertoire of each period, including traditional western as well as non-traditional and non-western works, will be selected for in-depth study. Intended primarily for piano majors. This is the first course in a sequence of two: Mus 437 and Mus 438.
Also offered for graduate-level credit as Mus 537 and may be taken only once for credit. . Prerequisite: Mus 304, Mus 305, Mus 306.

## Mus 438 - Keyboard Literature II (3)

A study of Romantic and Twentieth-Twenty First Century literature for piano. In addition to providing an overview of the his torical development of keyboard music, specific works from the repertoire of each period, including traditional western as well as non-traditional and nonwestern works, will be selected for in-depth study. Intended primarily for piano majors. This is the second course in a sequence of two: Mus 437 and Mus 438.
Also offered for graduate-level credit as Mus 538 and may be taken only once for credit. . Prerequisite: Mus 304, Mus 305, Mus 306.

## Mus 439 - Instrumental Literature (3)

An intensive study of the development of literature for various individual or groups of instruments (e.g., flute, clarinet, oboe, bassoon, s axophone, trumpet, horn,
trombone, tuba, violin, viola, cello, bass, percussion, brass, woodwinds, strings). The course may be listed with the specific instrument in the title.
Also offered for graduate-level credit as Mus 539 and may be taken only once for credit. .Prerequisite:Mus 304, Mus 305, Mus 306.

## Mus 445 -Business of Music (3)

Comprehensive examination of performance and production as professions for mus icians of all genres. Areas of focus include employment strategies, professional affiliations, music career expectations, entertainment industry and management. Topics includebranding, marketing, accounting, taxes, distribution and labels, rights and royalties, business relationships, and professional organizations.
Also offered for graduate-level credit as Mus 545 and may be taken only once forcredit. Prerequis ite: upper-division standing.

## Mus $\mathbf{4 5 0}$ - Collaborative Piano Literature Strings (3)

Introduction to the instruments from the string family through in-depth study of the instruments themselves and standard duo repertoire.

Also offered for graduate-level credit as Mus 550 and may be taken only once forcredit. Prerequisite: Mus 304, Mus 305, Mus 306.

## Mus 451 - Collaborative Piano Literature Winds and Brass (3)

Introduction to the instruments fromthe woodwind and brass family through in-depth study of the instruments themselves and standardduo repertoire.
Also offered for graduate-level credit as Mus 551 and may be taken only once forcredit. Prerequisite: Mus 304, Mus 305, and Mus 306.

## Mus 452 - Advanced Keyboard Techniques (3)

This course is designed to provide pianists with skills needed to function successfully in many different profes sionalenvironments. Many of these skills were previously common among pianists such as transposition, harmonization, and figured bassreading butfell out of favor over time. Other advanced skills were born out of today's professional requirements such as playing froma chord chart, using electronic instruments, andextended keyboard techniques.
Also offered for graduate-level credit as Mus 552 and may be taken only once forcredit.

## Mus 470 - Topics in Music History (2)

Examines a selected theme in music history to be drawn from specific composers, performers, genres, styles, works, geographical locations, or time periods. Topics will be
contextualized to address broader issues of race, ethnicity, gender, cultural significance, ownership, transmission, technology, and globalization. Specific topics vary by term. Course may be taken more than once with permission of instructor.
Also offered for graduate-level credit as Mus 570. Prerequisite: Mus 306.
Mus 471 - Advanced Jazz Improvisation I (2)
Advanced concepts of jazzimprovis ation. Principles of pentatonics, diminished harmonies, inside-outside playing, synthetic scales, and free improvis ation. Instructor approval required. This is the first course in a sequence of three: Mus 471, Mus 472, and Mus 473.
Also offered for graduate-level credit as Mus 571 and may be taken only once for credit. . Prerequisite:Mus 271,Mus 272, and Mus 273.

## Mus 472 - Advanced Jazz Improvisation II (2)

Advanced concepts of jazzimprovis ation. Principles of pentatonics, diminis hed harmonies, inside-outside playing, synthetic scales, and free improvisation. Instructor approval required. This is the second course in a sequence of three: Mus 471, Mus 472, and Mus 473.

Also offered for graduate-level credit as Mus 572 and may be taken only once for credit. . Prerequisite: Mus 271, Mus 272, and Mus 273.

## Mus 473 - Advanced Jazz Improvisation III (2)

Advanced concepts of jazzimprovis ation. Principles of pentatonics, diminis hed harmonies, inside-outside playing, synthetic scales, and free improvisation. Instructor approval required. This is the third course in a sequence of three: Mus 471 , Mus 472, and Mus 473.
Also offered for graduate-level credit as Mus 573 and may be taken only once for credit. . Prerequisite: Mus 271, Mus 272, and Mus 273.
Mus 474-Midi Applications (2)
Study of the fundamentals of MIDI and computer music programs. Includes work on synthesizers, sequencing, and notation software. This is the first course in a sequence of two: Mus 474 and Mus 475.
Also offered for graduate-level credit as Mus 574 and may be taken only once for credit. . Prerequisite: consent of instructor.

## Mus 476 - Computer Music Composition (3)

Introduces concepts, applications, and projects in sound synthesis, sampling, and digital signal processing. Students learn to create real time compositions using a graphical programming environment and studio pieces using various soundediting applications.

Prerequisite: Mus 242, Mus 247, or permission of instructor.

## Mus 481 -Pedagogy (3)

Methods, materials, curriculum, and philosophical bases for teaching in a private studio and clas sroom with focus on individual and group instruction. This is the first course in a sequence of three: Mus 481, Mus 482, and Mus 483.

Prerequisite: Mus 213, Mus 216, Mus 304, Mus 305, Mus 306.

## Mus 484 -Music with Children (3)

Methods and materials for teaching general music classes in the elementary school. Designed for the music specialist; required of all students who seek a basic teaching certificate in music. It is presupposed that all students have performing and theoretical skills and at least one year of music history. Concurrent enrollment in an appropriate practicum(Mus 409) required.
Also offered for graduate-level credit as Mus 584 and may be taken only once for credit. Prerequisite: upper division standing in music.

## Mus 485 -Diction for Singers: Italian (2)

Designed for singers and other musicians interested in classical vocal literature in Italian, this course presents the principles of lyric diction and provides practice in the skills needed to sing in Italian correctly, idiomatically, and expres sively. This is the first course in a sequence of three: Mus 485, Mus 486, and Mus 487.

Also offered for graduate-level credit as Mus 585 and may be taken only onceforcredit. .Prerequisite: Upperdivision standing.

## Mus 486 -Diction for Singers: German (2)

Designed for singers and other musicians interested in classical vocal literature in German, this course presents the principles of lyric diction and provides practice in the skills needed to sing in German correctly, idiomatically, and expressively. This is the second course in a sequence of three: Mus 485, Mus 486, and Mus 487.
Also offered for graduate-level credit as Mus 586 and may be taken only once for credit. . Prerequisite: Upperdivision standing.

## Mus 487 -Diction for Singers: French (2)

Designed for singers and other musicians interested in classical vocal literature in French, this course presents the principles of lyric diction and provides practice in the skills needed to sing in French correctly, idiomatically, and expressively. This is the third course in a sequence of three: Mus 485, Mus 486, and Mus 487.

Also offered for graduate-level credit as Mus 587 and may be taken only once for credit. . Prerequisite: Upperdivision standing.
Mus 490 - Fundamentals of Acting for Singers (3)
Acting training tailored to singers pursuing careers in performance. Methods are Stanislavski-based, combined with Meisner techniques, and Reichean breath work. The class will involve some lecture, but will primarily focus on storytelling, character development, and other performance techniques taught in an experiential fashion.

Also offered for graduate-level credit as Mus 590 and may be taken only once for credit. Prerequisite: Mup 190 and Mup 290.

## Mus 501 - Research (1-9)

(Credit to be arranged.) Consent of ins tructor.

Mus 502 - Independent Study (1-9)
(Credit to be arranged.)

Mus 503 -Thesis (1-9)
Thes is (Credit to be arranged.)

## Mus 504 - Cooperative Education/Internship (1-9)

(Credit to be arranged.)

## Mus 505 - Reading and Conference (1-6)

(Credit to be arranged.) Consent of instructor.

## Mus 506-Graduate Project or Recital (1-4)

Final conducting project or performance recital required for all Master of Music degrees.

## Mus 507 -Seminar (1-6)

(Credit to be arranged.) Consent of instructor. Recent topics have included Style Analysis; Style Criticism; Music History; Music in the Elementary School; Seminar in Composition.

## Mus 508-Workshop(1-6)

(Credit to be arranged.)

## Mus 509-Practicum(1-9)

(Credit to be arranged.)

## Mus 510 -Selected Topics (1-6)

(Credit to be arranged.)

## Mus 511 -Music Research Methods (3)

A systematic study of research techniques and materials in music his tory, literature, and music education. Emphas is on the use of library resources and practical applications of research techniques.
Prerequisite: graduatestanding in music.
Mus 512 -Graduate Theory Review (3)
A course designed for graduate students who need to review theirknowledge of basic theoretical concepts. Can be taken forcredit but will not be applied toward completion of degree requirements.

## Mus 513 -Score Reading (3)

Techniques for reading and studying scores with a goal of performance.

## Mus 514 -Graduate Aural Skills ReviewI (1)

Designed for graduate students who need to review basic aural skills. Sight singing, melodic and harmonic dictation, aural identification, and improvisation are integral elements of this study. Note: graduate review class credits cannotbe applied towards completion of degree requirements.

## Mus 515 -Graduate Aural Skills Review II (1)

Designed for graduate students who need to review basic aural skills. Sight singing, melodic and harmonic dictation, aural identification, and improvisation are integral elements of this study. Note: graduate review class credits cannot be applied towards completion of degree requirements.
Prerequisite: Mus 514.

## Mus 516 -Graduate Aural Skills ReviewIII (1)

Designed for graduate students who need to review basic aural skills. Sight singing, melodic and harmonic dictation, aural identification, and improvisation are integral elements of this study. Note: graduate review class credits cannot be applied towards completion of degree requirements.

Prerequisite: Mus 515.
Mus 520 - Analytical Techniques (3)
Study of analyticaltechniques applied to musical compositions of various styles to discover sources of unity, variety, order, and expression present in them. The application of a variety of analytical approaches will guide discovery of musical materials, harmonic and rhythmic relationships, compositional procedures, and formal structures in music. This course may be repeated for credit.
Prerequisite:Pass Mus 057 or Mus 512.
Mus 521 - Analysis of Contemporary Music (3)
Thorough study of compositional techniques and structural devices used in contemporary art music. Topics include formal, harmonic, and rhythmic aspects of the music. Impressionism, serialism, set theory, indeterminacy and minimalism are addres sed. The focus is on post-tonal music.
Also offered for undergraduate-level credit as Mus 421 and may be taken only once for credit. . Prerequisite: Mus 057 or Mus 512.
Mus 522 - Advanced Orchestral Arranging (3)
Instruction in writing for instruments used in large orchestras, showing basic techniques of scoring for string quartet, wood wind and brass quintet, and percussion ensemble. Practical application through scoring of piano music for various orchestral groups of the nature and capability found in the public schools.

Prerequis ite: successful completion of the department's graduate entrance examination.

## Mus 523 - Advanced Choral Arranging (3)

Study of voice types, text setting, and techniques of writing for various combinations of voices. Practice in arranging melodies for two-, three, and four-part choruses, mixed and unmixed, such as those encountered in the public schools.
Prerequis ite: successful completion of the department's graduate entrance examination.

## Mus 524 - Instrumental Jazz Arranging I (2)

In-depth study and application of the fundamentals of composing and arranging for s mall to large jazz ensembles. Subjects included are his tory, transposition, instruments, forms, harmonic and melodic construction, rhythmsection, voicing, moving harmonization, score and part preparation, vocal arranging techniques, rehearsal techniques, and MIDI applications. Instructor approval required. This is the first course in a sequenceof three: Mus 524, Mus 525 , and Mus 526.
Also offered for undergraduate-level credit as Mus 424 and may be taken only once for credit. .

## Mus 525 - Instrumental Jazz Arranging II (2)

In-depth study and application of the fundamentals of composing and arranging for s mall to large jazz ensembles. Subjects included are his tory, transposition, instruments, forms, harmonic and melodic construction, rhythmsection, voicing, moving harmonization, score and part preparation, vocal arranging techniques, rehearsal techniques, and MIDI applications. Instructor approval required. This is the second course in a sequence of three: Mus 524, Mus 525, and Mus 526.
Also offered for undergraduate-level credit as Mus 425 and may be taken only once for credit. .

## Mus 526 - Instrumental Jazz Arranging III (2)

In-depth study and application of the fundamentals of composing and arranging for s mall to large jazz ensembles. Subjects included are his tory, transposition, instruments, forms, harmonic and melodic construction, rhythmsection, voicing, moving harmonization, score and part preparation, vocal arranging techniques, rehearsal techniques, and
MIDI applications. Instructor approval required. This is the third course in a sequence of three: Mus 524, Mus 525, and Mus 526.

Also offered for undergraduate-levelcredit as Mus 426 and may be taken only once for credit. .

## Mus 527 - Opera Workshop (1)

A workshop in preparing and performing operatic literature for advanced singers.
Also offered for undergraduate-level credit as Mus 427 and may be taken only once for credit. . Prerequisite: consent of instructor through audition.

## Mus 528 - Opera Production (1-2)

Annual production of a major operatic work. Designed for singers, orchestral instrumentalists, and technical support staff in the areas of costuming, set design, and other areas. Casting for production is by audition during winter quarter. This course may be repeated for up to 9 credits.
Also offered for undergraduate-levelcredit as Mus 428.

## Mus 529 - Grad History Review (3)

A course designed for graduatestudents who need to review their knowledge of basic historical concepts of music. Can be taken forcredit but will not be applied toward completion of degree requirements.

## Mus 530 -Song Literature (3)

Study of the solo literature for voice through analysis of scores and recordings and live performances. Historical perspectives fromElizabethan song to 20th-century art songs. Also offere for undergraduate-level credit as Mus 430 and may be taken only once for credit.

Prerequisite: Mus 304, Mus 305, Mus 306.

## Mus 531 - Chamber Music Literature (3)

Historical survey of the music associated with the chamber music repertoire from 1600-1950. Emphas is on analysis of scores and recordings.
Also offered for undergraduate-level credit as Mus 431 and may be taken only once for credit. . Prerequis ite: Mus 304, Mus 305, Mus 306.

## Mus 532 - Band Wind Literature (3)

A study of literature for ensembles of wind and wind/percussion instruments fromabout 1600 to the present. Historical perspective will be gained through reading, style-analysis, and listening. Attention will be given to the practical application of band literature in elementary and secondary teaching situations.
Also offered for undergraduate-level credit as Mus 432 and may be taken only once for credit. . Prerequis ite: Mus 304, Mus 305, Mus 306.

## Mus 533-Orchestral Literature (3)

A historical survey of the music associated with the symphony orchestra fromthe development of each orches tral ins trument to the present day. Intensive study of those works of great significance is achieved through score study and analysis of several interpretations through recordings. Attention will be given to the practical application of orchestral literature in elementary and secondary teaching situations.

Also offered for undergraduate-level credit as Mus 433 and may be taken only once for credit. . Prerequis ite: Mus 304, Mus 305, Mus 306.

## Mus 534 - Choral Literature I (3)

The objective of this course is to develop an understanding of the depth and breadth of choral music written from the Middle Ages to the Clas sical era. The course will examine representative literature fromthese eras, and will help each student to establish a more thorough knowledge of the repertoire, as they work towards diverse and innovative programming in their eventual choral conducting careers.
Also offered for undergraduate-level credit as Mus 434 and may be taken only once for credit. .

## Mus 535-Choral Literature II (3)

The objective of this course is to develop an understanding of the depth and breadth of choral music written fromthe Romantic Period to the Present Day. The course will examine representative literature fromthese eras, and will help each student to establish a more thorough knowledge of the repertoire, as they work to wards diverse and innovative programming in their eventual choral conducting careers.

Also offered for undergraduate-level credit as Mus 435 and may be taken only once for credit.

## Mus 536 - Opera Literature (3)

An intensive study of the development of opera in western music, from the works of Monteverdi in the early 17th century to the important operas of this century.

Also offered for undergraduate-level credit as Mus 436 and may be taken only once for credit. . Prerequisite: Mus 304, Mus 305, Mus 306.

## Mus 537 - Keyboard Literature I (3)

A study of Baroque and Classical literature for keyboard instruments. In addition to providing an overview of the historical development of keyboard music, specific works from the repertoire of each period, including traditional western as well as non-traditional and non-western works, will be selected for in-depth study. Intended primarily for piano majors. This is the first course in a sequence of two: Mus 537 and Mus 538.

Also offered for undergraduate-level credit as Mus 437 and may be taken only once for credit. .
Mus 538 - Keyboard Literature II (3)
A study of Romantic and Twentieth-Twenty First Century literature for piano. In addition to providing an overview of the his torical development of keyboard music, specific works from the repertoire of each period, including traditional western as well as non-traditional and nonwestern works, will be selected for in-depth study. Intended primarily for piano majors. This is the second course in a sequenceoftwo: Mus 537 and Mus 538.
Also offered for undergraduate-levelcredit as Mus 438 and may be taken only once for credit. .

## Mus 539 - Instrumental Literature (3)

An intensive study of the development of literature for various individual or groups of instruments (e.g., flute, clarinet, oboe, bassoon, s axo phone, trumpet, horn, trombone, tuba, violin, viola, cello, bas s, percussion, brass, woodwinds, strings). The course may be listed with the specific instrument in the title.
Also offered for undergraduate-levelcredit as Mus 439 and may be taken only once for credit. . Prerequisite: Mus 304, Mus 305, Mus 306.
Mus 540 - Jazz Literature (3)
Study and analysis of the classic Jazz compositions and recordings.

Prerequisite: Mus 355U.
Mus 541 - Advanced Conducting Methods (3)
Study of the concepts of conducting applied to a wide range of mus ic literature. Music of different eras will be
used to analyze and practice the conductor's process. Incorporated into the study of conducting will be rehearsal techniques and relevanthistorical and theoretical concepts, providing an integrated study of the conductor's art. This course is intended for MA/MS in Music graduate students, MM in Conducting graduate students, or senior-level undergraduate students with instructor permis sion.
Prerequisite: graduatestanding in music or permis sion of instructor.

## Mus 542 - Advanced Choral Conducting (3)

Study of the concepts of conducting applied to a wide range of choral music. Music of different eras will be used to analyze and practice the conductor's process.
Incorporated into the study of conducting will be rehearsal techniques and relevanthistorical and theoretical concepts, providing an integ rated study of the conductor's art.
Particular attention given to the creative role of the University, Church, Community, and Public SchoolChoir Director. This course is intended for MM in Conducting graduate students.
Prerequisite: graduate standing in music.

## Mus 543 - Advanced Instrumental Conducting (3)

Study of the concepts of conducting applied to a wide range of instrumental music. Music of different eras will be used to analyze and practice the conductor's process. Incorporated into the study of conducting will be rehears al techniques and relevanthistorical and theoretical concepts, providing an integrated study of the conductor's art. Particular attention given to the creative role of the University, Community, Professional, and Public School Band or Orchestra Conductor. This course is intended for MM in Conducting graduate students.
Prerequisite: graduatestanding in music.

## Mus 545 - Business of Music (3)

Comprehensive examination of performance and production as professions for musicians of all genres. Areas of focus include employment strategies, professional affiliations, music career expectations, entertainment industry and management. Topics include branding, marketing, accounting, taxes, dis tribution and labels, rights and royalties, business relationships, and professional organizations.
Also offered for undergraduate-level credit as Mus 445 and may be taken only once for credit. Prerequisite: upperdivision standing.
Mus 550 - Collaborative Piano Literature Strings (3)
Introduction to the instruments fromthe string family through in-depth study of the instruments themselves and standard duo repertoire.

Also offered for undergraduate-levelcredit as Mus 450 and may be taken only once for credit.

## Mus 551 - Collaborative Piano Literature Winds and Brass (3)

Introduction to the instruments from the woodwind and brass family through in-depth study of the instruments themselves and standard duo repertoire.

Also offered for undergraduate-levelcredit as Mus 451 and may be taken only once for credit.
Mus 552 - Advanced Keyboard Techniques (3)
This course is designed to provide pianists with skills needed to function successfully in many different profes sionalenvironments. Many of these skills were previously common among pianists such as transposition, harmonization, and figured bassreading butfell out of favor over time. Other advanced skills were born out of today's professional requirements such as playing froma chord chart, using electronic ins truments, and extended keyboard techniques.

Also offered for undergraduate-levelcredit as Mus 452 and may be taken only once for credit.
Mus 560 -Music History: The Medieval Period (2)
Intensive, analytical study of the history of music of the Middle Ages and its relationship to contemporary his torical events. This course may be repeated for credit.
Prerequisite: Pass Mus 056 or Mus 529.
Mus 561 -Music History: The Renaissance Period(2)
Intens ive, analytical study of the history of music from 1400 to 1600 and its relationship to contemporary his torical events. This course may be repeated for credit.
Prerequisite: Pas s Mus 056 or Mus 529.

## Mus 562 -Music History: The Baroque Period (2)

Intensive, analytical study of the history of music from 1600 to 1750 and its relationship to contemporary his torical events. This course may be repeated for credit.
Prerequisite: Pass Mus 056 or Mus 529.

## Mus 563 -Music History: The Classical Period (2)

Intensive, analytical study of the history of music from 1750 to 1825 and its relationship to contemporary historicalevents.
Prerequisite: Pas s Mus 056 or Mus 529.
Mus 564 -Music History: The Romantic Period (2)
Intensive, analytical study of the history of music from 1825 to 1900 and its relationship to contemporary his torical events. This course may be repeated for credit.
Prerequisite: Pas s Mus 056 or Mus 529.

Mus 565 - Music History: Early 20th Century (2)
Intensive, analytical study of the history of music from 1900 to 1950 and its relationship to contemporary historical events. This course may be repeated for credit.
Prerequisite: Pass Mus 056 or Mus 529.
Mus 566 - Music History: Music Since 1950 (2)
Intensive, analytical study of the history of music since 1950 and its relationship to contemporary historical events. This course may be repeated for credit.
Prerequisite: Pass Mus 056 or Mus 529.
Mus 567 - Jazz History (2)
Advanced studies in Jazz History. Course involves individual research projects culminating in student class presentations. This course may be repeated for credit.

Prerequis ite: Pass Mus 056 or Mus 529.
Mus 570 - Topics in Music History (2)
Examines a selected theme in music history to be drawn from specific composers, performers, genres, styles, works, geographical locations, or time periods. Topics will be contextualized to address broader issues of race, ethnicity, gender, cultural significance, ownership, transmission, technology, and globalization. Specific topics vary by term. Course may be repeated once with permission of instructor.
Also offered for undergraduate-level credit as Mus 470.
Mus 571 - Advanced Jazz Improvisation I (2)
Advanced concepts of jazzimprovis ation. Principles of pentatonics, diminished harmonies, inside-outside playing, synthetic scales, and free improvisation. Instructor approval required. This is the first course in a sequence of three: Mus 571, Mus 572, and Mus 573.

Also offered for undergraduate-level credit as Mus 471 and may be taken only once for credit. Prerequisite: Mus 271, Mus 272, and Mus 273.

## Mus 572 - Advanced Jazz Improvisation II (2)

Advanced concepts of jazzimprovis ation. Principles of pentatonics, diminished harmonies, inside-outside playing, synthetic scales, and free improvisation. Instructor approval required. This is the second course in a sequence of three: Mus 571, Mus 572, and Mus 573.
Also offered for undergraduate-level credit as Mus 472 and may be taken only once for credit. . Prerequisite: Mus 271, Mus 272, and Mus 273.
Mus 573 - Advanced Jazz Improvisation III (2)
Advanced concepts of jazzimprovis ation. Principles of pentatonics, diminished harmonies, inside-outside playing, synthetic scales, and free improvisation. Instructor
approval required. This is the third course in a sequence of three: Mus 571, Mus 572, and Mus 573.

Also offered for undergraduate-level credit as Mus 473 and may be taken only once for credit. . Prerequisite: Mus 271, Mus 272, and Mus 273.

Mus 574-Midi Applications (2)
Study of the fundamentals of MIDI and computer music programs. Includes work on synthesizers, sequencing, and notation software. This is the first course in a sequence of two: Mus 574 and Mus 575.

Also offered for undergraduate-level credit as Mus 474 and may be taken only once for credit. . Prerequisite: consent of instructor.

## Mus 580 - Body Mapping for Musicians: Anatomy, Physiology, Movement and Sensory Awareness (2)

Provides musicians with anatomical information about the body in movement, which will assist the performersing and sound a musical instrument without pain, tension, or injury. The curriculum will improve facility and expressiveness and once acquired, as sist the student to incorporate Body Mapping techniques into their teaching.

## Mus 581 -Pedagogy (3)

Methods, materials, curriculum, and philosophical bases for teaching in a private studio and clas sroomwith focus on individual and group instruction. This is the first course in a sequence of three: Mus 581, Mus 582, and Mus 583.

Also offered as undergraduate-level credit as Mus 481 and may be taken only once for credit. . Prerequis ite: Mus 213, Mus 216, Mus 304, Mus 305, Mus 306.

## Mus 584 -Music with Children (3)

Methods and materials forteaching general music clas ses in the elementary school. Designed for the music specialist; required of all students who seek a basic teaching certificate in music. It is presupposed that all students have performing and theoretical skills and at least one year of music history. Concurrent enrollment in an appropriate practicum(Mus 409) required.
Also offered for undergraduate-level credit as Mus 484 and may be taken only once for credit. Prerequisite: upper division standing in music.

## Mus 585 -Diction for Singers: Italian (2)

Designed for singers and other musicians interested in classical vocal literature in Italian, this course presents the principles of lyric diction and provides practice in the skills needed to sing in Italian correctly, idiomatically, and expres sively. This is the first course in a sequence of three: Mus 585, Mus 586, and Mus 587.

Also offered for undergraduate-level credit as Mus 485 and may be taken only once for credit. .

## Mus 586 - Diction for Singers: German (2)

Designed for singers and other musicians interested in classical vocal literature in German, this course presents the principles of lyric diction and provides practice in the skills needed to sing in German correctly, idiomatically, and expressively. This is the second course in a sequence of three: Mus 585, Mus 586, and Mus 587.

Also offered for undergraduate-level credit as Mus 486 and may be taken only once for credit. .

## Mus 587 -Diction for Singers: French (2)

Designed for singers and other musicians interested in classical vocal literature in French, this course presents the principles of lyric diction and provides practice in the skills needed tosing in French correctly, idiomatically, and expressively. This is the third course in a sequence of three: Mus 585, Mus 586, and Mus 587.

Also offered for undergraduate-level credit as Mus 487 and may be taken only once for credit. .

## Mus 588 - Advanced Choral Methods (3)

Designed for the experienced teacher. In addition to studies of current methods and trends in choral music teaching, the course also provides a forumfor problemsolving and dealing with special issues and problems in current choral music education.

## Mus 590 - Fundamentals of Acting for Singers (3)

Acting training tailored to singers pursuing careers in performance. Methods are Stanislavski-based, combined with Meisner techniques, and Reichean breath work. The class will involve some lecture, but will primarily focus on storytelling, character development, and other performance techniques taught in an experiential fashion.
Also offered for undergraduate-level credit as Mus 490 and may be taken only once for credit. Prerequisite: Mup 190 and Mup 290.

## Mus 594 - Chamber Music (1)

Instruction in the art of small ensemble performance; the established repertory of string, wind, keyboard, or vocal chamber music. Maximum: 6 credits.
Prerequisite: graduatestanding in music.
Mus 595 - Band (1)
Maximum: 6 credits.
Prerequisite: graduatestanding in music.

## Mus 596 - Orchestra(1)

Maximum: 6 credits.
Prerequisite: graduate standing in music.
Mus 597 - Chorus (1)
Maximum: 6 credits.
Prerequisite: graduatestanding in music.

## Mus 598 -Jazz Lab Band (1)

Performance of jazz literature in a big bandsetting. Maximum: 6 credits.

Prerequisite: graduatestanding in music.

## NAS - Indigenous Nations Studies

## NAS 201 - Introduction to Native American Studies (4)

Introduction to the principal subject matter and interdisciplinary methods of Native American studies. Topics include understanding traditional cultures and languages and their significance for contemporary native peoples; the political and legal status of Native Americans in the United States and at the U.N.; contemporary native communities and tribal governments; Native American literature, art, music, dance, both contemporary and traditional.

## NAS 299 - Special Studies (1-4)

(Credit to be arranged.)

## NAS 301 - Introduction to Native American Languages

 (4)General introduction to the linguistic and cultural background of end angered native languages of North America. Topics include structure of native languages; relationship of language to other aspects of culture such as worldview, social org anization, and story telling; history of language change and current tribal projects to revitalize native languages.

## NAS 306 - Red Power (4)

The Red Power movement arose in reaction to centuries of oppressive federal oversight of American Indian peoples. It comprised an assortment of gras sroots organizations that fought for treaty rights, tribal sovereignty, selfdetermination, cultural preservation, and cultural relevancy in education. This course will examine the Alcatraz occupation and the governmentres ponse.

NAS 334U- Topics in Film Genres and Movements (4)
Study of major aesthetic, cultural, and social movements in film.

## NAS 335U- Topics in Literature and Film (4)

Study of the interplay between the textual and cinematic presentation:how these media have treated specific historical, social, and cultural phenomena, as well as the ways literature and film have inspired and influenced each other in terms of content, form, and audience. This is the same course as Eng 335U and may be repeated for credit with different topics.
Cross-Listed as: Eng 335U.

## NAS 342 - Indigenous Gardens and Food Justice (4)

This course examines impacts of colonization on local/traditional foods and health; ethnobotany; and revitalization practices of Indigenous land, water and food sovereignty. Students partner with Native American communities on site design and implementation of edible/medicinal gardens and participate in restoration and creative place-based projects on public lands.

## NAS 344 - Indigenous Women Leadership (4)

From Sacajawe a to Winona LaDuke, this course identifies the contributions of Indigenous women as keepers of tradition, leaders, teachers, healers, activists and visionaries, drawing upon their voices to understand leadership principles fundamental to Native American and global communities. Social justice, particularly in areas of land and the environment, is emphasized.

## NAS 346 - Contemporary Issues in Indian Country (4)

This course examines issues and challenges in Indian Country today, including economic development, natural resourcemanagement, health, education, identity and assimilation, social and environmental justice, tribal sovereignty and treaty rights, and the revitalization of Native cultures in the 21st Century. Students will develop a deeper awareness of those issues and how tribes and urban Native communities and org anizations are planning, advocating, and taking action locally, nationally, and globally. This course may be repeated for up to 8 credits .

## NAS 348 - Indigenous Practices for Environmental Sustainability (4)

This course examines Traditional Ecological Knowledge and Indigenous methodologies and how they affect/inform environmental sustainability, education and land/water management practices and policies. Students spend time in
natural areas exploring relationship-building, creative place-based projects, and analysis of current is sues facing social/environmental justice in Native American communities.

## NAS 349 - Indigenous Leadership for Sus tainable

 Futures (4)We will explore Indigenous leadership styles, strategies, and skills used by individuals in their communities, including governmental and tribal/indigenous org anizations, nonprofits and informal groups. The course looks at the effects of globalization on human and more-than-human populations and our environment, and offers insights into the role/application of Seventh Generations/sustainability principles and indigenous values and practices to address contemporary social, environmental and economic challenges, including Climate impacts fromcolonizing practices globally.

## NAS 351 - Indigenous Philosophy (4)

Surveys historical and contemporary indigenous philosophical writings on decolonization, epistemology, metaphysics, and ethics. The majority of the texts will be from authors such as BlackElk, Vine Deloria, Jr, and Leslie Marmon Silko, but sources fromindigenous peoples across the globe should also be considered. Possible topics may include indigenous perspectives on sovereignty, properhuman relationships with the land, waters, and animals, communication through storytelling, language, and dance, and gender-sexual identity.

## NAS 392 - Indigenous Ways of Knowing (4)

This course presents a basic world view of Indigenous peoples identifying useful concepts, terms, intellectual frameworks and strategies in their struggles toward liberation and self-determination. Combining feminist, anti-racist theory and tribal critical race theory, this course explores Indigenous philosophy as a means to transforma Eurocentric consciousness.

NAS 404 - Cooperative Education/Internship (1-12)
Prerequisites:NAS 201, and 8 upper-division credits in NAS or courses approved by adviser.

## NAS 405 - Reading and Conference (1-8)

(Credit to be arranged.)

NAS 406 -Special Projects (1-12)
(Credit to be arranged.)

NAS 407-(1-6)

## NAS 410 -Selected Topics (1-4)

(Credit to be arranged.)

## NAS 411 - Nationhood: Tribal Sovereignty, Governance \& Policy (4)

Nationhood examines prevalent theories and strategies for pursuing Indigenous self-determination fromboth inside and outside the s tate-centric globalcapital system. This course looks to distinguish between Indigenous placebased cultures and Western time-oriented heritages by utilizing position and land occupation as an ontological framework for understanding relationships.

Prerequisite: Upper-division standing.

## NAS 417 - Maintenance and Revitalization of Endangered Languages (4)

General introduction to endangered language revitalization, with a focus on native languages of the Pacific Northwest. Topics include history of attempts to eradicate native languages and the effects on those languages and their communities; theoretical basis for revitalization; emerging tribal policies; and relations between linguists and native communities.

## NAS 422 -First Foods of the Pacific Northwest (4)

Using examples from the Pacific NW, this course will investigate the interconnected social, cultural, and political relationships between Indigenous food systems, spirituality, kinship, food sovereignty, and ecology; from subsistence food traditions to government commodity foods to urban Native American food movements. We will contemplate and learn about Traditional Ecological Cultural Knowledge (TECK) and the impact of colonization on Indigenous food systems and landscapes from a place based lens.

Also offered for graduate-level credit as NAS 522 and may be taken only once for credit. Prerequisite: NAS 201 or instructor approval.

## NAS 424 - Cultural Ecology: Indigenous Science and the Natural World (4)

What does "science" mean to you? Indigenous peoples have practiced "science" sincetime immemorial. This applied course will provide the basis for understanding "science" through the perspective of Traditional Ecological and Cultural Knowledge, and how Indigenous teachings guide values and protect First Foods. Traditional ecological and cultural knowledge, Indigenous teachings, values and First Foods will ground and guide students through their course experience which will include a mixture of lecture, discussion, film, group exercises \& field excursions to gain awareness of Indigenous Science.
Prerequisite: NAS 201 or instructor approval.
NAS 426 - Tribal Critical Race Theory (4)
This course involves the discourse on Native American Studies fromthe perception of Indigenous storytellers, artists, and activists whose compelling productions undertake critical examinations of imperialism, history, writing and theory-- focusing on strategies of res istance. These productions will help us challenge myths about Indigenous peoples which replicate and reproduce stereotypes.
Prerequisite: NAS 201 or instructor approval.
NAS 442 - Decolonizing Methodologies: Insurgent Res earch and Indigenous Education (4)
Decolonizing Methodologies will provide students the analytical tools and methods necessary for conducting applied research, as well as exploration of the practical, ethical, and political is sues involved in conducting research with Indigenous communities. This course integrates a post-colonial research utilizing a decolonized lens - encouraging students to engage in community-based research.

Prerequisite: NAS 201 or instructor approval.
NAS 502 - Independent Study (1-12)
(Credit to be arranged.)

NAS 506 -Special Projects (1-12)
(Credit to be arranged.)

## NAS 509-Practicum(1-9)

(Credit to be arranged.)

## NAS 510 -SelectedStudies (1-8)

(Credit to be arranged.)

## NAS 522 - First Foods of the Pacific Northwest (4)

Using examples from the Pacific NW, this course will investigate the interconnected social, cultural, and political relationships between Indigenous food systems, spirituality, kinship, food sovereignty, and ecology; from subsistence food traditions to government commodity foods to urbanNative American food movements. We will contemplate and learn about Traditional Ecological Cultural Knowledge (TECK) and the impact of colonization on Indigenous food systems and landscapes from a place based lens.
Also offered for undergraduate-level credit as NAS 422 and may be taken only once forcredit.

## Norw - Norwegian

## Norw 101 - First-Year Norwegian Term 1 (4)

Beginning Norwegian. Emphasis on communication skills: listening, speaking, reading, writing. This is the first course in a sequence of three: Norw 101, Norw 102, and Norw 103.

## Norw 102 - First-Year Norwegian Term 2 (4)

Beginning Norwegian. Emphasis on communication skills: listening, speaking, reading, writing. This is the second course in a sequence of three: Norw 101, Norw 102, and Norw 103.

## Norw 103 -First-Year Norwegian Term 3 (4)

Beginning Norwegian. Emphasis on communication skills: listening, speaking, reading, writing. This is the third course in a sequence of three: Norw 101, Norw 102, and Norw 103.

## Norw 199 -Special Studies (1-5)

(Credit to be arranged.)

## Norw 201 -Second-Year Norwegian Term 1 (4)

Intensive review of basics introduced in first-year courses and further development of communication skills. This is
the first course in a sequence of three: Norw 201, Norw 202, and Norw 203. Recommended prerequisite: Norw 103.

## Norw 202 -Second-Year Norwegian Term 2 (4)

Intensive review of basics introduced in first-year courses and further development of communication skills. This is the second course in a sequence of three: Norw 201, Norw 202, and Norw 203. Recommended prerequisite: Norw 103.

## Norw 203 -Second-Year Norwegian Term 3 (4)

Intensive review of basics introduced in first-year courses and further development of communication skills. This is the third course in a sequenceof three: Norw 201, Norw 202, and Norw 203. Recommended prerequisite: Norw 103.

Norw 299 -Special Studies (1-5)
(Credit to be arranged.)

Norw 399 -Special Studies (1-8)
(Credit to be arranged.)

## OMSE - Software Engineering

OMSE 500 - Principles of Software Engineering (3)
An introduction to software engineering in industry. This course focuses on understanding the nature of software engineering, the software engineering process, and the problems and solutions manifest in real software development and modification projects. Different models of the software engineering process are compared and contrasted. Current best practices in software engineering and various approaches to software process improvement are presented. Two years of software development experience is required for registration.

OMSE 510 - Special Topics (1-4)
(Credit to be arranged.)

## OMSE 511 - Managing Software Development (3)

Provides the knowledge and skills needed to plan, org anize, lead, and control a software project. Topics include planning and estimating, meas uring and controlling, and leading and directing a software project. Quantitative measures and risk management will be emphasized throughoutthe course. Students will prepare project plans for real or hy pothetical soft ware projects, to include effort, cost, and schedule estimates and risk management plans. Two years of software development experience is required for registration.

OMSE 513 - Professional Communication Skills for Software Engineers (3)
Covers the skills necessary for appropriate professional conduct and effective communication in a professional setting. It includes technical writing, making effective presentations, conducting effective meetings, conflict resolution, teamand decision-making skills, and professional ethics. Students willengage in a project that covers the major topics of the course. Two years of software development experience is required for regis tration.

## OMSE 514 - Computing Foundations (3)

Introduction to the building blocks of a basic computing machine including the central processing unit, data transfer buses, registers, programcounters, various types of memories, and instruction sets. A range of processor architectures and org anizations including pipelining, virtual memory and caching are explored. Also explores the principles of operating systems and how they relate to the underlying hardware structures as well as concurrency, process synchronization, process scheduling, memory management, interrupthandling, and device management. Basic understanding of C or $\mathrm{C}++$ required.

## OMSE 515 -Software Foundations (3)

Introduction to fundamental language constructs including pointers, recursion and abstraction, and the principles of algorithmic analysis and Big-O notation. Progressively explores several foundation data structures and algorithms including linked lists, trees, hashing, and graphs which are illus trated using C, C++ and Java code fragments. Introduces selected topics in statistics and discrete mathematics, in particular, sets, set operations, propositional calculus, first-order predicate calculus and
finite state machines. Registration requires permis sion of the OMSEprogramoffice. Recommended prerequisite: Mth 112.

## OMSE 516 -Software Process Improvement (3)

How to effectively introduce improvements to software engineering processes in theirorganization. Designed to help the student successfully discover and improve software engineering practices in such areas as software requirements, architecture, design, coding, integration and testing. Technical is sues are emphasized but balanced with real-world considerations including org anizational politics, corporate culture, and psychology.
Prerequisite: OMSE500.

## OMSE 517 - Agile Software Development (3)

Designed for graduate level software engineering students who are interested in learning and applying the fundamentals of the Agile software development process in the real world. Explores Agile concepts both in theory and practice. Introduction to the principles and foundations of Agile Development, XP (Extreme Programming) and the SCRUM methodology. Also introduces the students to day-to-day life on an Agile team. Expected preparation: OMSE 500.

## OMSE 521 - Using Metrics and Models to Support Quantitative Decision Making (3)

Provides the knowledge and skills needed to apply quantitative tools based on metrics and models of the software product and development process to make decisions under uncertainty. Topics covered will include measurement concepts, decision-making under uncertainty, and model and metric development for the software development enterprise. Foundation coursework is required for registration.

## OMSE 522 - Modeling and Analysis of Software

 Systems (3)Abstract models are used to formalize specifications of software systems. Formalized reference specifications serve as a basis for the design of software implementations and for validating critical properties of software sy stems. Provides the fundamental mathematical concepts needed to understand abstract models of software and to reason about them. Foundation coursework is required for registration.

## OMSE 525 -Software Quality Analysis (3)

Processes, methods, and techniques for developing quality software, for as sessing software quality, and for
maintaining the quality of software. Tradeoffs between software cost, schedule time, and quality. Integrating quality into the software development process; formal review and inspection methods; principles of testing and test planning; module design for tes tability; maintaining quality while supporting existing software. Two years of software development experience is required for registration.

## OMSE 531 -Software Requirements Engineering (3)

Principles, tools, and techniques for requirements elicitation, specification, and analysis. Focus on understanding the role of requirements in the development process, goals of the requirements phase, es sential difficulties of specifying requirements for real systems, and effective methods, tools, and techniques. Covers techniques for formally modeling and specifying software requirements with hands-on experience. Two years of software development experience is required for registration.

## OMSE 532 -Software Architecture and Domain Analysis (3)

Methods and principles of the architectural design of complex, large-scale software systems to accommodate change and evolution through many product releases or vers ions. Survey of the major architectural styles, their strengths and weaknesses, and architectural trade-offs with respect to systemgoals and desired properties. Study of architectural approach to de velopment of open systems and frameworks based on case studies. Software engineering of domain-specific software architectures for families of systems (e.g.,product lines) including domain analysis, domain modeling, and design of domain-specific software architectures. Relation of software architecture to requirements and its effects on downstreamdesign and software evolution. Students examine domain analysis and the architectural design process and products in the businesscontext including the effect of decisions on cost and schedule. Foundation coursework is required for registration.

## OMSE 533-Software Design Techniques (3)

Covers the principles of software design and a survey of design methods, techniques, and tools. In-depth and handson study of at least one method such as object-oriented design as applied to a realistic industrial problem. Examines the effects of design decisions on the functional and non-functional properties of the software (e.g., easeof understanding, maintainability, and reuse) and how software engineering principles are applied to make appropriate trade-offs. Also examines the design process
and products in context including the effect of design decisions on function, quality, cost, and schedule. Foundation coursework is required for regis tration.

## OMSE 534 -Software Estimating (3)

Software estimating techniques and tools enable the res ponsible software engineering manager to as sess project feasibility, secure adequate budgets, and manage project tasks and schedules. The student learns how to make viable software estimates to consistently inform software project planning, scheduling, and oversight. The full range of software estimating methods and tools are explored.
Prerequisite: OMSE500, OMSE 511.
OMSE 535 -Software Implementation and Testing (3)
Covers the principles of implementing and verifying computer software. Implementation topics include coding style, packaging principles, reuse, testability, and maintainability. Verification topics includestructural (white box) testing and techniques for code verification. Also included will be verification and integration of foreign code; testing techniques and how to apply them; including code-based and specification-based testing; hands-on application of the testing process including test case generation; and test adequacy, test validation, test execution, and automation. Foundation coursework is required for registration.

## OMSE 551 - Strategic Software Engineering (3)

Where traditional software engineering focuses on the development and maintenance of individual systems, strategic software engineering addresses the development of multiple systems over time. Significant gains in productivity, cost, and schedule can re sult from sy stematic improvement of the software development process and systematic reuseof life-cycle products over multiple developments. Covers the principles, methods, and tools for strategic software development including process modeling and improvement, developing programs as families of systems, and systematic approaches to code generation and the reuse of non-code products, including requirements and design.
Prerequisite: All previous OMSEcourses.

## OMSE 555 - Software Engineering PracticumI(3)

The objective of the practicumis to provide hands-on software engineering management and development experience applying the principles, methods, processes and tools learned fromOMSE courses. The practicumis comprised of two parts and org anized as two courses, OMSE 555 and OMSE556 (3 credits each) completed in sequence. The class is grouped into one or more integrated project teams jointly undertaking a coordinated software
engineering problem. The evaluation (grading) process equally weights group and individual performance. Problems undertaken by student teams apply the practices learned in OMSE clas ses across the s oftware engineering process. Projects range fromtechnical evaluations, analysis and specification, through architectural design to prototype development and testing. Every project involves applying best project management, quality assurance and configuration management practices. This is the first course in a sequence of two: OMSE 555 and OMSE556 which must be taken in sequence.

Prerequisite: All core OMSEcourses other than OMSE 555 and OMSE 556, namely, OMSE 500, OMSE 511, OMSE 513, OMSE 525, OMSE 531, OMSE 521, OMSE 532, OMSE 533, OMSE 534, OMSE 535 and OMSE 551.

## OMSE 556 -Software Engineering Practicum II (3)

The objective of the practicumis to provide hands-on software engineering management and development experience applying the principles, methods, processes and tools learned fromOMSE courses. The practicumis comprised of two parts and organized as two courses, OMSE 555 and OMSE556 ( 3 credits each) completed in sequence. The class is grouped into oneor more integrated project teams jointly undertaking a coordinated software engineering problem. The evaluation (grading) process equally weights group and individual performance. Problems undertaken by student teams apply the practices learned in OMSE classes across the software engineering process. Projects range fromtechnical evaluations, analysis and specification, through architectural design to prototype development and testing. Every project involves applying best project management, quality assurance and configuration management practices. This is the second course in a sequence of two: OMSE 555 and OMSE 556 which must be taken in sequence.

Prerequisite: All core OMSEcourses other than OMSE 555 and OMSE 556, namely, OMSE 500, OMSE 511, OMSE 513, OMSE 525, OMSE 531, OMSE 521, OMSE 532, OMSE 533, OMSE 534, OMSE 535 and OMSE 551.

OSEA - Overseas Programs

## \$name

OSEA 199 -Special Studies -Study Abroad (1-18)
(Credit to be arranged.)

## \$name

OSEA 299 -Special Studies -Study Abroad (1-18)
(Credit to be arranged.)

## \$name

OSEA 399 - Special Studies-Study Abroad (1-18)
(Credit to be arranged.)

## \$name <br> OSEA 410 -SelectedStudies -Study Abroad (1-18)

(Credit to be arranged.)

## \$name

OSEA 510 -SelectedStudies - Study Abroad (1-9)
(Credit to be arranged.)

## PA - Public Administration

## PA 299 - Special Studies (1-4)

(Credit to be arranged.)

## PA 311U - Introduction to Civic Engagement (4)

This course examines the concept of civic engagement by exploring how relationships are strengthened and communication is nurtured among members of society, and how this contributes to a civic identity that promotes socially conscious thought and action. The course will examine the values, skills and actions that contribute to a sense of civic identity through as signed readings, lectures, discussions, group activities, and self-reflection. A central goal of this course is to help students prepare for a lifetime of responsible citizenship and civic engagement. This course includes a community-based learning project.

## PA 312U - Foundations of Community Leadership (4)

This course explores the role of community leadership in advancing civic engagement, civils ociety, civic capacity, community-building, reasoned debateand otherkey civic virtues in democratic societies. Students will integrate leadership theory with practical observations in the context of the United States' socio-political history and the role of civic engagement in ourevolving social system. The course builds a definition for community leadership that recognizes the close interface between the role of public servants as agents of policy implementation and the role of citizens as active stewards of the public good.

## PA 313U - Fundamentals of Public Service (4)

Exploration of how public serviceinforms the roles of public/nonprofit organizations in social change. Introduction to conceptual public service frameworks and exploration of the historical dimensions, underlying values and external forces that shape contemporary public service. Ways forcommunity members to influence public policy through civic engagement are addressed.

## PA 314U- Students as Leaders (4)

Introduces the concepts of leadership fromtheoretical and practical perspectives. Students will explore their own leadership competencies using the Social Change Model in relation to individuality, group dynamics and community building. Through in-class activities, interviews, and research, students will examine leadership as an individual/group process to create social change.

## PA 315U - Managing People for Change (4)

This course examines today's workforce and the new competencies required to manage people to meet the corresponding modern day challenges. It borrows from contemporary discussions about public sector (government and nonprofit) organizations as well as private sector org anizations. Topics include human capital, workplace politics, intergenerational challenges, and job/wage disparities.
Prerequisite: junior standing.

## PA 316 -Leadership in New Student Programs (3)

Focus on developing an understanding of the transitional needs of students and their families upon entering Portland State University (PSU). Explores the demographics of students and identifies student development theory in relationship to New Student Programs. Key topics include: utilizing the ChangeModel of Leadership Development, teamwork, communication, student development, leadership development, and diversity.

## PA 320U - Introduction to Nonprofit Management (4)

Introduction to the importance of the nonprofit sector in contemporary society andexamination of the sector's contribution to the social, political, and economic economy. Emphasis placed on practical application of nonprofit management theory, helping students gain the knowledge and skills appropriate to taking on nonprofit leadership roles.

## PA 399 -Special Studies (1-4)

(Credit to be arranged.)

## PA 402 - Independent Studies (1-8)

(Credit to be arranged.)

PA 403-(1-9)

## PA 405 - Reading and Conference (1-8)

(Credit to be arranged.)

## PA 406 - Special Projects (1-8)

(Credit to be arranged.) Consent of instructor.

## PA 409 - Practicum (1-12)

(Credit to be arranged.)

## PA 410 - Selected Topics (1-6)

(Credit to be arranged.)

## PA 412 - Civic Engagement: The Role of Governing Institutions (4)

This course develops understanding of how local governments carry out their governance responsibilities and the roles they play within the larger scheme of the American democratic system. The goalis to assess how the structures and processes of local governments affect opportunities for democratic accountability, citizen participation, the development of civic capacity, citizenship and civic leadership.
Prerequisite: PA 311U or PA 312U.

## PA 413 - Civic Engagement: The Role of Individuals (4)

This course provides an overview of the role of the individual in civic engagement processes. Students will develop an understanding of the variety and forms of engagement processes in which individuals participate within local and national governments and public organizations. The course focuses on developing students' ability to critically analyze a variety of civic engagement processes and understand the consequences, limitations, opportunities, and benefits of these various processes. Students will examine whether individuals have equal opportunities to engage in political and socialdecisionmaking structures, and how they serve as change agents to address social injustice.

Prerequisite: PA 311U, PA 312U or PA 313U.

## PA 414-Civic Engagement: The Role of Social Institutions (4)

Develops an understanding of the roles that social institutions (voluntary associations, public interest groups, educational and religious institutions, and nonprofit organizations) play within democratic societies.
Additionally, the course investig ates the literature on social institutions and social capital, including their his torical development, modern forms, social functions, and ways in which they shape individuals' participation in governing processes. Students will examine the relationships among socially sustainable communities, strong social institutions and private interests by analyzing the mechanis ms that generateparticipation and deliberation.

Prerequisite: PA 311U or PA 312U.

## PA 415 -Civic LeadershipIntegrative Seminar (4)

This seminar is devoted to exploring, investigating, discussing, understanding, and synthesizing the theoretical understandings and practical applications of civic leadership. Students will have an opportunity to reflect upon, synthesize, and showcase their knowledge through development of a portfolio that demonstrates their learning about civic leadership.

Prerequisite: One of PA 311U, PA 312U or PA 313U, plus one of PA 412, PA 413 or PA 414.

## PA 417 - Ethical Leadership (4)

Explores potential ethical conflicts faced by leaders in public and community service. The course will provide students with ethical leadership models that will help them to judge the ethical compromises that may put personal, professional, organizational, and public service values in conflict with one another. Coursework will include a review of the theoretical concepts that underpin ethical leadership and will explore their practical application through case studies and the experiences of elected and career public officials who have faced ethical dilemmas in public and community service.
Prerequisite: PA 312U or PA 313U.

## PA 425 - Grantwriting for Nonprofit Organizations (4)

Students will acquire necessary skills to write successful grant proposals for foundations and other private funders. Students will learn how to: develop a project idea, plan a project or program, cultivate and work with prospective funders, develop and write a proposal, and generally learn skills to strengthen the grant-seeking process.

## PA 430 - Recruitment of Volunteers (2)

This course takes a marketing approach to volunteerism. Interactive activities and dis cussion build on applying basic principles of volunteerism; examining different styles
of volunteering; building a recruiting plan; examining marketing for volunteers; and managing recruitment. Assignments are interactive and designed to build applicable skills.
Prerequisite: upper-division standing.

## PA 431 - Training of Volunteers (2)

This course engages students in organizing training and continuing education sessions for volunteers. Topics include: how adults learn, learning styles, building content, meas ureable learning objectives, selecting the best teaching techniques, and evaluation of learning. Assignments are interactive designed to build skills directly applicable to a manager of volunteers program.
Prerequisite: upper-division standing.

## PA 432 - Leadership and Management of Volunteer Programs (2)

The healthy organization aligns support for staff who work with volunteers, makes volunteers an integral part of all work, provides staff development, and rewards staff accomplishments related to work with volunteers. In this course students will gain an understanding of the impact of communication style and leadership on volunteer programs.

Prerequisite: upper-division standing.

## PA 433 - Evaluation and Recognition of Volunteer Programs (2)

Students are exposed to evaluation methods, types, and styles for programs and for individual volunteers. Motivational theories are connected to the effectiveness of different type of recognition. Assignments are interactive and designed to build skills directly applicable to a manager of volunteers program.

Prerequisite: upper-division standing.

## PA 501 - Research (1-9)

(Credit to be arranged.)

## PA 502 - Independent Study (1-9)

(Credit to be arranged.)

## PA 504-Cooperative Education/Internship (1-9)

(Credit to be arranged.)

## PA 505 - Reading and Conference (1-6)

(Credit to be arranged.)

## PA 506 -Special Projects (1-6)

(Credit to be arranged.) Consent of instructor.

## PA 507 -Seminar (0-6)

(Credit to be arranged.)

## PA 508 -Reflective Practice (3)

(Credit to be arranged.)

## PA 509-Organizational Experience (1-6)

Final integrativeexperience required for all M.P.A. and M.P.A.:HA students, who have limited or no adminis trative experience, and for all M.P.H.:HMP students reg ardless of experience. The student completes a field experience with an appropriate agency, culminating in a project report systematically analyzing an administrative problemthat is bothinstructive to the student and of importance to the agency. Students are required to attend an orientation seminar to aid themin planning how the field experience will integrate with their coursework and their career goals, and to cultivate the habit of reflective practice. PA 509 may only be taken after students have earned at least 42 credits in their programof study.

## PA 510 -Selected Topics (0-6)

(Credit to be arranged.)

## PA 511 - Public Administration (3)

The role of administration in a democratic society. The course surveys the field, the development of the profession and practices in public administration, and examines the legal, historical, economic, and political foundations of the A merican governmental and nonprofit traditions.

## PA 512 - Case Analysis (3-6)

This course is designed to provide mid-career students with adminis trative experience an opportunity to develop skills in the areas of reflective practice, adminis trative problemsolving, consulting, and coaching. Students will be required to present a case problemthey developed as the basis of an exercise in adminis trative problemsolving and coaching for their fellow students.
Prerequisite: at least three years of full-time adminis trative or management experience in a public, nonprofit and/or healthcare organization and 42 hours of completed course work toward the degree.

## PA 513 - Administrative Ethics and Values (3)

Explores values, ethics, and morality in public sector administration. It considers such concepts and is sues as the following: personal and professional values and roles; the myth of value neutrality; the public interest; values, ethics, and change; value trade-offs; ethical ambiguities; ethical codes, fiscal ethics, and ethics and adminis trative discretion.

Prerequisite: PA 511.

## PA 514 - Global Leadership and Management (3)

Contemporary g lobal realities require emerging public sector leaders to prepare thems elves by learning adaptable leadership and management concepts and tools. This core course is designed to equip interested students, both from the U.S. and abroad, with professional skills and practical knowledge that will help them "to lead and manage res ponsibly" in a range of global settings.

## PA 515 - Public Works Administration (3)

A general overview of adminis trative practices in public works, including an evaluation of organizational practices, project management, and relationships to political processes. The course will consider actual problems in the administration of public works.

## PA 516 - Current Issues in Public Management (3)

Explores two major strategies for the reform of public organizations: (1) an economic-centered approach that emphasizes private market-place incentives and the meas urement of outcomes and (2) a civic dialogue approach that advocates the useof deliberative processes, reliance on collaboration, and a greater role of nonprofit org anizations in the design and delivery of public services. The purposeof this course is to examine these approaches within the context of traditional models that haveguided the public policy and management role of the bureaucracy in the American system of democratic governance.

## PA 517 - Leadership Development for Public Organizations (3)

Course focuses on two activities: (1) use of as sessment instruments to prepare individual leadership profiles and (2) an examination of various leadership theories with applications to specific leadership situations. The goal of the course is to as sist participants in understanding their own individual leadership styles and capacities and to better appreciate what is required to successfully lead at an individual, team/group, org anizational, and larger community level.

## PA 518 -Leading Public Organizations (3)

Course seeks to develop an understanding of the essential ingredients of leading public organizations, including creating a vision, developing support for the vis ion, and transforming the vision into an organizational legacy. It focuses on the distinctive role res ponsibilities of the leader as an agent of the organization within the larger community setting, thus distinguishing the course from other leadership clas ses that focus on either an individual or org anizational perspective. As part of this larger external focus, participants acquire the knowledge and skills to undertake inter-jurisdictional and strategic planning, conflict management, to work with the media, and to develop and implement collaborative agreements.

## PA 519 - Civic Capacity (3)

Examines the factors that contribute to the capacity of communities to create social agreement and to sustain collective action over time. Provides students with an opportunity to evaluate current research on the factors that contribute to the development of social capital and to apply this research to field-based community building activities.

## PA 520 - Introduction to Nonprofit Management (3)

Introduces students to a wide range of management needs, problems, and is sues of not-for-profit org anizations. It considers suchitems as the following: the executive director as manager; as pects of governance; volunteer/staff relations; personnel administration; budgeting and financial management; fund raising and sources of revenue; long-range planning; and community organization.

## PA 521 -History And Foundations of the Nonprofit Sector (3)

Provides an introduction to thehistory and development of the private, nonprofit sector in the United States. It explores theories and concepts that describe the social, political, legal, and economic meaning of volunteerism, philanthropy, and the nonprofit sector as a sector separate from government and business. It provides a specific focus on the relationship of nonprofit to government in the delivery of public services within the context of a welfare state.

## PA 522 - Governance of Nonprofit Organizations (3)

Addresses the history and functions of boards in the nonprofit sector, including an examination of the roles of boards in governance and leadership; policy and administration; decision-making processes; board-staff
relations; resource development; board composition and recruitment; ethics and liability; and current research on boards and organizational effectiveness.

## PA 523 - Nongovernmental Organizations: Nonprofits on the World Stage (3)

Introduction to the history and development of Nongovernmental Organizations (NGOs) and the roles they play on the world stage. Examines the causes of the growth and significant role of NGOs in creating civil society, as well as the roles of NGOs in fighting oppression, safeguarding theenvironment, building and training workforces and advocating major societal changes.

## PA 524 - Financial Management in Nonprofit Organizations (3)

Designed to provide participants withoutformal accounting or finance training with the conceptual framework and practical tools needed to providestrong fiscal management and fiscal leadership in the nonprofit environment. For students with formal finance and/or accounting background, the course will provide opportunities to compare and contrast fiscal management objectives and functions in nonprofit with those found in for profit and/or governmentalentities. It is structured to illus trate the nonprofit fiscal management cycle: planning, execution, recording, reporting, and monitoring.

## PA 525-Grantwriting for Nonprofit Organizations (3)

The process of grant acquisition, beginning with the formulation of a fundable idea and concluding in an application and its review. Students are expected to identify potential funding sources, initiate inquiries, and develop an application for funds to support a programor study of special interest. The steps in this process are discussed in general terms and in the context of each student's application. The focus is the development of grants fromprivate rather than public funders.

## PA 526 - Fundamentals of Fundraising in Nonprofit Organizations (3)

Creating an environment for successful fund development within a nonprofit organization is a serious undertaking that requires a substantive understanding of, and experience with, development programs and fundraising practices. Course provides the learner with the basic theories, principles, and techniques for fund development.

## PA 527 -New/Emerging Nonprofits: Development and Management (3)

Intended to develop knowledgeable leaders for the nonprofit sector that understand how to establish and manage newly emerging org anizations. Examines a wide range of management and leadership needs, problems and is sues that arise for an org anization in its early years. Explores how an organization develops and emerges and how the traditional tasks of management: supervision, planning, budgeting, fundraising and marketing can be most effectively administered. Recommended prerequisites: PA 520 or PA 521.

## PA 528 -Leadership for the Nonprofit Sector (3)

Examination of the challenges nonprofit leaders face in working across org anizations, jurisdictions, and sectors to address entrenched social problems. This course operates from the as sumption that a collaborative, systems -based approach to leadership is es sential for sustained success. Through this course, students will learn essential leadership concepts and practices to expand their abilities to address and negotiate leadership challenges that arise when stakeholders come together to plan, make decisions, and take action in org anizational, community, and sectorwide settings.

## PA 529 - Nonprofit Field Study in Oaxaca, Mexico (3-6)

An intensive immersion programin Oaxaca, Mexico, offered by the Institute for Nonprofit Management in the Hatfield School of Government. Course includes nonprofit field study and site visits, cultural immers ion homestays, and visits to cultural sites. The program varies fromyear to year in the types of nongovernmental nonprofit organizations the students visit, based in part on the interests of the students who register. Site visits in recent years have included programs for juvenile offenders and gang members, human rights advocacy groups, medical clinics, an AIDS education program, and a coalition of environmental groups. On-site translation is provided so that proficiency in Spanish is not necessary, but Spanish language study is part of the immersion experience.

## PA 530 - Higher Education Policy (3)

Seminar explores critical is sues and opportunities facing today's higher education. Also examines the organization and governance of colleges and universities in the contemporary policy arena. The overarching theme of this course is how interactions and tensions betweenhigher education institutions and policy makers and public influence and shape universities.

## PA 533-Public Policy: Origins and Process (3)

Drawing on the general concept of the policy cycle, this course explores the central actors, processes, and is sues as sociated with all stages of the public policy process. The course considers the interactions among the branches and levels of government, interest groups, nonprofit organizations, and the private sector. Tensions among various forces that affect the development and implementation of policy approaches are considered throughout the course.

## PA 534 - Administrative Law (3)

When policies receive the formal status of laws, they acquire a special significance for the executive and judicial branches. This course examines the process of policy implementation through the use of adminis trative discretion and the rule-making process. Delegation of legis lative power, judicialreview, informal adjudication, and the role of the adminis trative law judge are emphasized. The limits of discretionary authority are explored. Students address the theoretical, practical, and ethical issues in implementation, giving particular attention to the relationship between stated goals and actual outcomes.

## PA 535 - Strategies for Organizing Recovery, Mitigation and Resilience (3)

Application of resilience concepts in the policy and planning context. The course provides tools for using resilience concepts in policy making, policy analysis, and hazards and dis aster planning. Introduces practical tools for analyzing community vulnerabilities and actions to take to improve resilience.
Cross-Listed as: This is the same course andEMCR 535 and may be taken only once for credit.

## PA 536 -Strategic Planning (3)

Provides an overview of the application of planning systems to public sector functions and explores newer "stakeholder" theories of planning, planning models, and the step-by-step process for initiating and engaging in strategic planning processes at various levels of government. Through the useof case studies and hands-on exercises, students are exposed to practical applications of strategic planning approaches and techniques.

## PA 537 - Law \& Public Policy (3)

Law and courts are critical to public policy. The policy process often starts with cases for which no formal policy exists. The seminar examines judges as policymakers and the operation the policy process when courts are involved.

It considers critical is sues in judicial policymaking, examines fields where courts have played important policy roles, contemplates difficulties faced by judges, and helps students develop techniques to analyze judicial policymaking.

## PA 538 - Advocacy and Political Participation by Nonprofit Organizations (3)

Exploration of the role of citizen advocacy and political participation in the United States in the twenty-first century. Investigates the many meanings of the term" civil society," as well as the role of nonprofit and voluntary org anizations in lobbying and advocacy, and the role of citizen movements in shaping local, national and global democracy. Will discuss and analyze specific advocacy campaigns with a focus on strategy.

## PA 539 - National Policy Process (3)

As a seminar in public adminis tration, the National Policy Process is studied on-site in W ashington, D.C. Attention is paid to the actors and the action of policy process, to the institutionalization of that process, and to the adminis trative components of that process. Meetings are arranged with key policy actors in appropriate organizations including the Office of Management and Budget, Congressional staff, lobbyists and think tanks, the General Accounting Office, regulatory boards, and various agencies. A current piece of legislation or set of legis lative initiatives is used as a case study throughout the week.

## PA 540 - Administrative Theory and Behavior (3)

Managing organizational systems to accomplish purposeful outcomes. Attention is given to how formal structures and informal processes influence organizational goals in public and nonprofit environments. This includes theories of org anizational, group, and individual behavior, such as org anizational design, power and authority, leadership, teamwork, communications, work des ign, and motivation. Emphasis is on managers and managing in public purpose organizations by reviewing major theories and their application and effective use.
Prerequisite: PA 511.

## PA 541 -Social Entrepreneurship(3)

This course provides students with core theories and concepts of social entrepreneurship, and contemporary approaches to entrepreneurship for the public and nonprofit sector. It analyzes successfulcases of social entrepreneurship and develops competencies to create org anizations that generate revenues while serving a social mission. Students learn about setting up and managing socialentrepreneurial ventures, focusing on the resources,
impact and support structures for social entrepreneurs. Students are given the opportunity to develop their own social entrepreneurial design.

## PA 542 - Sustainable Development Implementation (3)

Focuses on the challenges involved in attempting to turn international commitments and policy promises into action. Using examples from around the U.S. and around the world, we examine sus tainable development policy implementation and operation in an effort to see what worked, what did not, and how implementation challenges can be addressed.

## PA 543 - Creating Collaborative Communities (3)

Collaboration is perceived as an important method for addressing complex community is sues through alliances with otherorganizations in the non profit, for-profit, and government organizations. This course introduces students to the theory and practice of collaboration through in-class and "living" casestudies in the community. Students will learn the success factors, barriers to, and preconditions of collaboration at the intraorganizational, interorganizational, and intersectoral levels. They will explore the potential for using collaboration in a variety of community settings.

## PA 544 - International Field Experience (3)

Students are teamed with counterpart public servants and public organizations in a foreign country to understand "what counts for success" in developing and implementing public policy initiatives. Students usethis international comparative governance experience to reflect on the consequences for improving public service innovation and practices within their home organizations and jurisdictions in the United States. An additional important learning goal is to provide students with the knowledge and skills to work more effectively in cross-cultural teamsettings.

## PA 545-Organizational Development (3)

A consideration of org anization development as a strategy for org anizational change. This course emphasizes concepts and methodologies relating to organizational problemdiagnosis, action research, planned change, change implementation and evaluation, and the development of appropriate interpersonal competencies and skills. Focuses on the public manager as change agent.
Prerequisite: PA 540.

## PA 546 - Supervision in the Public Sector (3)

Focuses on the role of the supervis or in contemporary public and nonprofit organizations and the knowledge,
skills, and abilities needed to effectively performthis role. Among the topics considered are the ethics and values of supervision; work planning; delegating, motivating, and empowering; communicating effectively; developing a team; coping with conflict; monitoring and evaluating performance; and dealing with the boss(es).

## PA 547 - Culture, Values and Leadership (3)

Students reflect the role of culture and values in shaping the role res ponsibilities of public service and nonprofit leaders. Draws fromthe fields of cultural anthropology, inter-cultural communication, and organizational theory to explore how public and nonprofit servants can become more effective through the integration of cultural diversity into their nonprofit and public serviceroles.

## PA 549 - Cross-cultural Communication in the Public Sector (3)

An examination of intercultural communication aspects, processes, and scenarios occurring in public sector interactions. Emphas is on external client/ constituent relationships. Development of intercultural awareness is a key goal introduced through class discussion, scenario investigation, and research projects. The course is highly interactive with class discussion required.

## PA 550 - Managing Information Resources (3)

Considers information management and computer information systems as they affect public management and public policy. Basic concepts are covered, and emphasis is placed on the use of computerized information technologies as management tools for public sector adminis trators. Substantialuse is made of case studies to highlight how the public sector manager may most appropriately and effectively use computer res ources and avoid inappropriate and mis leading use of these resources.

## PA 551 - Analytic Methods in Public Administration I (3)

Topics to be covered include: research design, sampling methods and theory, data collection, techniques of data analys is and presentation, statistical reasoning, and computer applications for statistical analysis.

## PA 552 - Analytic Methods in Public Administration II

 (3)A continuation andexpansion of topics covered in PA 551, focusing on analytic methods used in research and evaluation of public sector policies, systems, and
programs. Topics to be covered may include: qualitative and quantitative applications in res earch design and data collection; statistical modeling, forecasting, program evaluation, and other areas of applied research.
Prerequisite: PA 551.
PA 552R - (0)

## PA 553 - Sustainable Development Policy and Governance (3)

Provides a foundation in sustainability-related policy design, policy analysis and governance approaches at multiple jurisdictional levels and in different cultural and social contexts. Explores challenges and opportunities related to developing policies and governance models that address the complexsocial, economic and environmental aspects of sustainability. Examines the role systems thinking plays in policy development and analysis in order to achieve integration across scales and sectors. Relevant topical is sues serve as the focus for exploring how policy development and governance develops on the ground.

## PA 554 - Policy Analysis Research (3)

Course requires student to become proficient in the use of reference tools for successfully undertaking policy research. Students are required to identify a policy is sue and to use library and online resources to track a piece of public policy through the stages of agenda-setting, legislative policy-making, adminis trative implementation, court adjudication, and follow-up analysis andevaluation of consequences. The course consists of a series of on-line exercises corresponding to each stage of the policy development and implementation process. The exercises are supplemented with discussion and lectures.
Also offered for graduate-level credit as PAP 654 and may be taken only onceforcredit.

## PA 555 - ProgramEvaluation and Management (3)

Examines programevaluation from the perspective of the public administrator. Covers the major approaches, methods, and concepts in the field of programevaluation. Topics include impact assessment, research design, qualitative evaluation methods, performance auditing, benefit-cost analysis, and other selected topics.

## PA 556 - Public Contract Management (3)

Explores what happens when public sector org anizations form working relationships with other agencies, communities, nonprofit organizations, or for-profit firms through contracts. It seeks to understand key elements of the formation, operation, and termination (or transformation) of these relationships and to do so from the
pers pective of the generalist manager rather than froma narrow technical view. The purpose here is not to debate whether government at all levels should do more contracting or less but to assess what happens when the decision is made to use contractual arrangements to performservices or provides materials.

## PA 557 - Operations Research in Public Administration (3)

Addresses the need for today's public adminis trators to have some understanding of the increasingly important tools of management science and operations research. It has no prerequisite: quantitative or technical background is not required. A variety of topics will be covered, with some flexibility in choice of topics according to students' interest. Topics include: linear programming, queueing, simulation, decis ion analysis, forecasting, PERT/CPM, inventory analysis, and replacement analysis. Methods taught in the course will be in the context of public administration.

## PA 558 - Managing Public Projects and Programs: From Local to Global (3)

Introduction to management concepts and tools required for the design, implementation and sustainability of public sector (government and non-governmental organizations) programs and projects. Draws on contemporary literature and case studies. Students apply their management learnings from this course to a real-life programor project.

## PA 559 - Research Design and Analytic Methods for Administrative Leaders (3)

This course provides adminis trative leaders with the es sential principles to frame, develop, review and evaluate research proposals. It also addresses appropriate data collection and analysis methods that aligns with the purpose of the research and supports research conclusions and claims.

## PA 560 - Local Government Administration (3)

Introduction to public adminis tration practice at the local government level. Addresses those factors that make local government administration unique, but informed by the fact that contemporary local government professionals are closely connected to a wide range of intergovernmental and often cross-sectoral working relationships. Local government administration learn that leadership within the organization, engagement with the community, and work across org anizational and juris dictional boundaries.

## PA 561 - Intergovernmental Relations (3)

This course addresses the complexweb of intergovernmental relations that is essential to the successful operation of public adminis tration and policy throughout the nation. At the core of these relationships is a set of concerns about the political, legal, fiscal, and org anizational relationships across governments and sectors. This course provides an in-depth examination of the foundations and challenges of these relationships.

## PA 562 - Managing Employee Performance in the Public Sector (3)

Managing human capital can be a challenging endeavor and doing so in the public sector, particularly in government, introduces the added burden of politics. This course explores the multifaceted nature of performance in the workplace including the political, legal, economical and managerial issues that often accompany addressing employee performance in the public sector (government and nonprofit). The goal is to manage and improve human resources while hold ing individual employees and pu blic agencies accountable for org anizational performance.

## PA 563 - Citizens and Administration (3)

This course analyzes modern civic life and its challenges. Its major focus is the often ambiguous relationship between citizens and adminis trators in the political system. Other topics emphasized are: transformation of civic life in modern times, declining citizen trust in government, modern approaches to citizen participation in government, and the future of "civism" in the United States.

## PA 564 - Environmental Policy and Administration (3)

Explores governance of the en vironment at international, national, regional, and local scales. The course examines federal, state, local, and informal institutions active in addressing air and water pollution, hazardous wastes, toxics management, and the causes of climate change. The course explores different disciplinary approaches for examining environmental policy is sues, how policy tools can be effectively matched to specific environmental problems, and how social sciences and ecology can be integ rated for effective environmental problem-solving.

## PA 565 - Natural Resource Policy and Administration (3)

Reviews the history, politics, and institutions related to current environmental and natural resource policy and its administration. Reviews policy domains like land and forest, water, energy, fish and wildlife, and environmental
quality. Special attention is paid to policy and adminis trative governance is sues like sustaining common pool goods, structuring intergovernmental relations, and evaluating policy implementation strategies of direct production, planning, regulation, and changing market incentives. A central premise is that natural resource administrators face a policy arena that is intrinsically problematic because of the dynamic nature of social values about natural resources, the long time horizon implicit in resource systems, the broadening geographic scale considered in natural resources decisions, and the interdependency of social and ecological communities. Recommended as a first course in the environmental and natural resource adminis tration specialization.

## PA 566 - Water Resources Policy and Administration (3)

Reviews the history, politics, and institutions related to current water policy and adminis tration in the United States. Examines policy history leading to present institutional and legal arrangements for federal, tribal, regional, state, and local water quality and quantity decision making. Attention is given to the industrial development of the Eastand created water resources of the arid West as a way to understand changing social sentiments toward water and water policy. Examines the evolution of purpose in pollution laws fromhuman health protection to include ecosystemhealth protection and explores implementation of such protection through "waters hed" approaches to land use and water quality management by NGOs, and federal, state, and local government. A major theme is the problemof developing coherent water policies in a policy arena which has divided authority, plural traditions, and multiple resource and socialissues.

## PA 567 -Energy Res ources Policy and Administration

 (3)Reviews the history, politics, and institutions related to current energy policy and adminis tration with particular attention to the Pacific Northwest and development of hydroelectric power. National energy policy history is reviewed including political, financial, and environmental problems. Explores the roles of interest groups; state, local, national, and international governments; and regional governing institutions. It explores the changing dis tribution of social costs and benefits as both a cause and result of policy change. Passage of the 1980 Northwest Power Act, the Northwest Power Planning Council created in the act, and the implementation of the act will be studied, as will current is sues like energy conservation, regional power planning, deregulation and the status of institutions involved in energy policy, and Columbia basin fish and wildlife conservation.

## PA 568 - Forest Policy and Administration (3)

Reviews the history, politics, and institutions related to forest res ource policy and management. Focuses on how policy affecting public and private forest land is made and implemented. Case studies, largely fromthe northwestern United States, are used to examine these processes. History, laws, and programs relating to forestland owners hip, public and private forest management, and as sociated environmental protection are studied at the federal and state levels. Special attention is given to understanding how public values about forests develop, and how public values affect public policy related to forests held by public, nonprofit, industrial, and private owners.

## PA 569 - Fish and Wildife Policy and Administration (3)

Reviews the history, politics, and institutions related to fish and wildlife policy and administration. Focuses on how policy affecting fish and wildlife is made and implemented. Case studies, largely fromthe northwestern United States, are used to examine these processes. Policy history is studied at the state and federallevel with particular attention to the federalization of authority in this arena and the role of interest groups in policy making and implementation. Current is sues like endangered species, the role of tribes, bio-diversity conservation, and interjurisdictional management of fish and wildlife are the focus of study.

## PA 570 - Environmental and Natural Resource Leadership (3)

Skills, styles and attributes of those who lead natural resource and environmental org anizations will be examined to enhance the leadership abilities of those in the class. Each class member will analyze presentations by current leaders, prepare a leadership prescription for an organization with which they are familiar, and design a leadership learning program. The course is intended for all those concerned with leadership in natural resource and environmental organizations, reg ardless of background. Considerable time will be devoted to exchange of information among those in the class.

## PA 572 - Columbia River Basin Governance (3)

Uses Columbia River Basin governance as a case study to build an understanding of how org anizational interests, culture, institutional identities, and values drive any collaborative governance framework. Examines the Basin's governance history and the interests of major
institutional actors through reading, writing, and expert panel discussion. Expected preparation: PA 540
Adminis trative Theory and Behavior.

## PA 573-Smart Grid and Sustainable Communities: Making the Smart Grid Work (3)

Provides students with a basic understanding of Smart Grid technology and the conditions that need to be in place for its success as a policy tool for reducing CO 2 emissions. Students will be provided with the his torical development of the technology and its currentstatus fromthe standpoint of policy implementation. Expected preparation: PA 540 Adminis trative Theory and Behavior.

## PA 574 -Food and Agriculture Policy (3)

Course explores food- and agriculture policy development and implementation at global, national, and local levels. Examines the social, economic and environmental as pects of food and agricultural systems, including impacts of trade and aid policies, the FarmBill, food system frameworks, and cross-cutting issues including water resources, toxics, and social equity.

## PA 575 -Foundations of Collaborative Governance (3)

This initial course provides an overview of the current governing context and thenew models that have emerged in response. In addition, students will explore the nature of collaborative relationships, the role of trust, harnessing the potential power of groups, and how to address conflict and reach consensus.

## PA 576 -Collaborative Governance Process and Systems (3)

This skills-based course focuses on the assessment, organization and phases of facilitating collaborative agreement-seeking processes, emphasizing techniques and challenges for reaching mutually satisfying agreements, including how to frame an is sue to increase the group's chance for success.

## PA 577 -Case Studies in Collaborative Governance (3)

Studentteams toreview three collaborative governance cases, one successful, one unsuccessful, and one a work in progress. A fourth case will be identified by the team. The course introduces ty pologies for different forms of collaborative governance and provides theory-based frameworks to assist in analyzing governance network efficacy.

## PA 578-Collaborative Governance Practicum(3)

In this culminating practicumstudents participate in discussions with faculty experts and fellow students as they apply the knowledge and skills gained in core courses to a community-based problem, is sue or project of their choosing.
Prerequisite: PA 575, PA 576, and USP 584.

## PA 579 - Policy Tools in Policy Design (3)

This course concerns the use of policy tools in designing public policy. It considers the strengths and weaknesses of the individual tools and the tradeoffs made in choosing or combining them. The way policy mechanisms and instruments are as sembled into a policy mix can be helpful or seriously problematic.

## PA 581 - Advanced Fundraising (3)

Focus on the understandings, processes, and skills that are neces sary for successful major gift development. As a skill development course, it follows the Fundamentals of Fundrais ing course (PA 526) which provides theory and content. The course will address the process of developing advanced fundraising techniques, beginning with the formulation of the development plan, moving through developing a gift management system, and concluding with application and design of effective gift stewardship. The steps in the process are identified in general terms with specific application applied to the context of student experience or projects. The course will also cover the role of leadership especially volunteer leadership and the relationship of that leadership with other human res ources such as the DevelopmentOfficer and the Chief Executive Officer. Expected preparation: PA 526.

## PA 582 - Public Budgeting (3)

Focuses on the major dimensions of public sector budgetary systems. Major emphasis will be devoted to the local budget processes. Topics will include basic concepts of public budgeting, the budget cycle, budget strategy, planning and presentation, alternative budgeting systems, the budget as a political and management tool.

## PA 583 - Advanced Budgeting Concepts and Techniques (3)

Investigates how budgeting can be used to review, analyze, and establish public policy and administrative accountability. Students learn how to: 1) design the best budget systemto fit various political environments; 2)review the effectiveness and efficiency of programs through budget analyses; and 3)use the budget to clarify public policy is sues andestablish management
accountability for performance. The mechanics of public budgeting will also be discussed in detail, including developing a budgetcalendar, making fund balance estimates, balancing revenues and expenditures, and monitoring the approved budget. Students should have practical experience or a previous course in budgeting.

## PA 585 - Financial Management in the Public Sector (3)

An investigation of the sources, methods, and mechanisms available for financing public organizations in a dynamic and complexenvironment. It includes a consideration of the administrative and behavioral as well as the economic dimensions of financing public org anizations. The examination identifies and explores the skills which are appropriate for managing contemporary public finance systems. Among the specific topics considered in this course are the following: taxand nontax sources of revenue; intergovernmental fiscal relations; debt management; productivity; rate analysis; cash flow management; and managing fiscal retrenchment.

## PA 587 -Principles andPractices of Emergency Management (3)

Explores the history, doctrines, and authorities of emergency management as well as the role of the emergency manager. It provides background on this emerging field as well on theoretical foundations of effective emergency management and strategies for effective emergency management leadership.
Cross-Listed as: This is the same course as EMCR 587 and may be taken only once for credit.

## PA 588 - International Perspectives on Disaster Management \& Resilience (3)

Narratives, images, and research across the globe continue to document the devastating effects of disasters, both human-made and natural. This documentation demonstrates the monumental effects disasters canhave on human life, infrastructure, and the natural environment, let alone an economy. Emergency management systems vary across nations and cultures, reflecting differential challenges, government types and capacity, public involvement and commitment to response, and cultural backgrounds.
Cross-Listed as: This is the same course as EMCR 588 and may be taken only once for credit.

## PA 590 - Human Resource Management in the Public Sector (3)

Adminis tration and management of human resource systems in public sector and nonprofit organizations. Focus is on the underlying values of human resource management, related public policies, structural patterns,
and the functional areas of HRM systems. Specific attention will be directed to the strategic roles of human resource management in day-to-day operations, merit systemconcepts and practices, position and wage classification systems, methods of securing a qualified labor force, and labor relations. Legal requirements in each of these areas will be examined. Emphas is will be on learning by doing through use of skill-building exercises, simulation and analysis of case materials, review of relevant case law, adminis trative rulemaking, and current literature. This courseserves as a foundation for PA 591.

Prerequisite: PA 511.

## PA 591 - Employment Law and Policy (3)

This course delves into the legal environment and the range of laws that are as sociated with the employment process fromrecruiting through termination or retirement and its overall policy impact on the practice of human resource management (HRM). Such areas entail federal, state and local legis lation as well as ordinances, statutes and Executive Orders that govern equal employment opportunity and the legal framework within which human resource management must operate. Also considered are the constitutionality of employment laws and how constitutional law is applied to certain groups that may render private sector employees somewhat distinct in some ways fromthose in the public sector, in this case, government or state actors (e.g., those who work on behalf of the government). This course is heavily focused on case law, case analyses and the impact of various court decisions over time on policy interpretations, HRM practices and charting the employment through termination processes. Expected preparation: PA 511 and PA 590.

## PA 592 - Volunteerism and Volunteer Management (3)

Examines the historical, social, and cultural context of voluntarismin America as a way of understanding who volunteers and why, and what difference it makes in the lives of org anizations and communities. The course includes skill development in the management and administration of volunteer programs in a nonprofit org anizational context, including volunteer program planning, evaluation of volunteer programs, recruitment, training, and retention of volunteers.

## PA 593 - Civil Rights for Public Managers (3)

Public service professionals deal with a variety of civil rights issues on a regular basis. They manage a diverse workforce with civil rights considerations central to effective human resource management. That diverse workforce serves increasingly diverse communities. Civil rights include race and ethnicity, but other is sues and groups as well. This course considers the major is sues of
civil rights froma public law perspective with a concern for the challenges facing public managers.

## PA 594 - Enhancing Diversity in the Workplace (3)

To examine the effects of diversity across org anizations with particular emphasis on those within the public sector. Three aspects of divers ity initiatives will be employed: valuing, enabling and managing diversity. A wide range of cultural and social diversity issues, to include but not limited to race, gender, age, nationality, class, language, sexual orientation and disability, will be discussed. Theories and practical tools will be explored and students will be given the opportunity to work on diversity is sues by way of discussions, case studies and field assessments.

## PA 595 - Public Sector Labor Relations (3)

The his tory and development of public sector labor relations in the United States. This course explores the impact of labor org anizations on government activities and the role of public sector managers in responding to unions. The course provides both a his torical context for labor relations and a set of precepts for working with labor org anizations in public administration. Fromhospitals, to school districts, regional government, cities, counties, state agencies and even some large nonprofits, this course explores the importance of developing and maintaining a constructive working relationship with the labor org anizations that represent the employees of those organizations.

## PA 596 - Public Sector Collective Bargaining: Negotiations and Impasse Resolution (3)

Deals with the diversity of roles of the parities in negotiation; planning for negotiations; development of original demands and fallback positions; negotiation strategy and tactics; the major issues in negotiating; and the diversity and similarity of negotiations in state government, cities, counties, school districts, and higher education. A mock negotiation case will be bargained. This course will also deal with the process of mediation, factfinding, and interest arbitration.
Prerequisite: PA 595.

## PA 598 - Values -bas edManagement I (3)

Introduces the model of values-based management as a method to enhance compatibility between the individual and the organization that is es sential for decision-making and supervision, particularly in nonprofit org anizations. Students will develop a theoretical understanding of the elements of effective supervision and of the impact that a director/supervisor has on thehuman res ource systemin their organizations. Students will work through the process
of clarifying agency mis sion, purpose, and values and develop skills for aligning their practices with these values.

## PA 601 - Research (1-9)

(Credit to be arranged.)

## PA 603 - Thesis (1-15)

(Credit to be arranged.)

## PA 605 - Reading and Conference (1-9)

(Credit to be arranged.)

## PA 607 -Seminar (1-9)

(Credit to be arranged.)

## PA 609 - Practicum (1-9)

(Credit to be arranged.)

## PA 610 - SelectedTopics (1-9)

(Credit to be arranged.)

## PA 699 - Special Studies (1-6)

(Credit to be arranged.)

## PA 710-Special Studies (1)

(Credit to be arranged.)

## PAH - Public Administration: Health

## PAH 399 - Special Studies (1-8)

(Credit to be arranged.)

## PAH 410 - SelectedStudies (1-6)

(Credit to be arranged.)

## PAH 509 - Practicum(1-6)

(Credit to be arranged.)

## PAH 543 - Culture and Health Care (3)

The course is designed to provide an examination of health delivery and outcomes and the influence of culture. Using readings in conjunction with interactive learning, students consider various cultures and their interactions with the health care system. Knowledge of the tools, techniques, and applications of cultural assessment and cultural competency will be achieved. This course is open to admitted students in the graduate programs in the Division of Public Adminis tration and other appropriate graduate programs. This is the same course as HSMP 543 and may be taken only once for credit.
Cross-Listed as:HSMP 543.

## PAH 570 - Health Administration (3)

An examination of is sues related to the adminis tration of health care systems. Topics include: changing patterns of health care, budget and financial management techniques, and political influences on health adminis tration. This is the same course as HSMP 570 and may be taken only once for credit.
Cross-Listed as: HSMP 570.

## PAP-Public-Affairs-Policy

## PAP 403 - Thesis (1-12)

(Credit to be arranged.)

## PAP 412 - Introduction to Policy Advocacy (3)

Examines the importance of public policy advocacy for public and nonprofit org anizations and the impact of policy advocacy on society.
Also offered for graduate-level credit as PAP 512 and may be taken only once for credit. . Prerequisite: upper-division standing.
PAP 504-(1-9)

## PAP 505 - Reading and Conference (1-9)

(Credit to be arranged.)

## PAP 508 - Professional Development Plan (1-3)

Professional development planning works hop for students enrolled in the Master of Public Policy program. Students work with faculty to prepare a professionaldevelopment plan, including career-goals, portfolio creation, job networking, and a programexit interview.
Prerequisite: Enrollment in the Master of Public Policy program.

## PAP 509-Public Policy Project (1-3)

Summative project for students enrolled in the Master of Public Policy program. Options include a research-oriented report or a client report linked to a short internship or placement experience.
Prerequisite: enrollment in Master of Public Policy program.

## PAP 510 - SelectedStudies (1-9)

(Credit to be arranged.)

## PAP 511 - Introduction to Public Policy (3)

This course explores fundamental concepts and approaches to public policy analysis and advocacy. Policy actors, process and issues are all part of the domain. The course will introduce students to a number of current policy issues.

PAP 512 - Introduction to Policy Advocacy (3)
Examines the importance of public policy advocacy for public and nonprofit organizations and the impact of policy advocacy on society.
Also offered for undergraduate-level credit as PAP 412 and may be taken only once for credit.
PAP 514 - Institutional Dynamics of Public Policy (3)
Focus on the institutional determinants and factors that shape the public policy arena. Coverage includes the varieties of institutions, including their rules and cultures, that affect public policy, how policy change strategies can incorporate institutions, and how institutions shape policy outcomes and impacts.

## PAP 533 - Ethics and Public Policy (4)

An examination of the normative dimensions of public policy, focusing both on the ethical is sues raised by the means of policymaking as well as the values that might shape the ends of public policy.
Cross-Listed as: Also offered for graduate-level credits as PS 533 and may be taken only once forcredit.

PAP 601 - Research (1-9)
(Credit to be arranged.)

## PAP 602 - Independent Study (1-9)

(Credit to be arranged.)

## PAP 603 - Dissertation (1-15)

(Credits to be arranged.)

PAP 604 - Internship(1-9)
(Credit to be arranged.)

PAP 605 - Reading and Conference (1-9)
(Credit to be arranged.)

PAP 606-Project (1-8)
(Credit to be arranged.)

## PAP 607 - Seminar (1-8)

(Credit to be arranged.)

PAP 609 - Practicum(1-9)
(Credit to be arranged.)

## PAP 610 - SelectedStudies (1-9)

(Credit to be arranged.)

## PAP 611 - Normative Foundations of Governance (3)

A survey of the major theories of the normative basis of governance that have shaped approaches to political legitimacy in the modern era.

## PAP 613 - Organization Theory and Behavior (3)

An examination of the structure and design of org anizations, the interaction of organizations and their environment, and the behavior of individuals within organizations. Application to problems of administration and governance.

## PAP 614 - Contemporary Governance (3)

Contemporary factors impacting governance world wide: political instability and fragmentation of government; erosion in the jurisdiction and power of the nation state and its causes; the search for new approaches and substitutes to government; accelerated blurring of sector boundaries; increasing use of third party providers; and non-political boundaries.

Prerequisite: admission to thePh.D. programin public administration and policy.

## PAP 615 - Administrative Process (3)

The purposeof this course is to explore the nature of the administrative process and its relationship to org anizational structure, process, and behavior within the broader context of programmatic and organizational governance. Emphasis will be placed on the following topics: the influence of structural alternatives on behavior; value systems and normative prescriptions; organizational culture; and the influence of the administrative process on the way in which agencies formulate and implement policy within the context of their res pective legislative mandates.
Prerequisite: admission to the Ph.D. programin public administration and policy.

## PAP 616 - Policy Process (3)

This course focuses on the politics of the policy process. It examines the role, influence, and interaction of legis latures, executives, bureaucracies, courts, policy communities, and citizens. The course follows the stages of policy development: problemdefinition, agendasetting, budgeting, authorization, implementation, and oversight. Case material is taken from federal, state, and local governments with special consideration given to the intergovernmental aspects of the policy process.
Prerequisite: admission to the Ph.D. programin public administration and policy.

## PAP 620 - Seminar on American Political Institutions

 (3)Introduction to the field of American Politics, with a particular focus on American political institutions and their respective sub-fields within the discipline of political science.

## PAP 621 - Comparative Political Institutions (3)

This course examines the performance, capabilities, and overall function of governments worldwide. Emphas is on advanced analyses of theories and concepts in comparative politics, with a particular focus on institutions of the state.

## PAP 630 - Proseminar in International Relations (4)

Graduate seminar surveys the main theoretical and analytical approaches encountered in the study of international relations. Themes include the grand theoretical traditions of liberalism, realis $m$, and radicalis $m$; analytical and methodological pers pectives, like behavioralismand rational choice theory; as well as the normative, critical, and postmodern challenges to the mains tream.

## PAP 645 - American Foreign Policy (4)

A seminar that explores different kinds of international disputes and actual conflicts in order to identify and assess theories, analy tical frameworks, and methods of conflict resolution, management, and prevention. Emphasis is on understanding the roots of conflicts and techniques that may be appropriate to different levels and dimensions of conflict.

## PAP 653 - Policy Analysis (3)

Introduction to policy analy sis as a practice of creating, assessing, and communicating information that is useful for understanding and improving policies. Theoretical methods of problems tructuring, forecasting, recommending, monitoring, evaluating, and improving policies.

## PAP 654 - Policy Analysis Research (3)

Course requires student to become proficient in the use of reference tools for successfully undertaking policy research. Students are required to identify a policy is sue and to use library and online resources to track a piece of public policy through the stages of agenda-setting, legislative policy-making, adminis trativeimplementation, court adjudication, and follow-up analysis and evaluation of consequences. The course consists of a series of on-line exercises corresponding toeach stage of the policy development and implementation process. The exercises are supplemented with discussion and lectures.
Also offered for graduate-level credit as PA 554 and may be taken only once for credit.

## PAP 656 - Advanced Political Economy (3)

Readings seminar provides a review of the literature in theories and selected is sues in international political economy. Core requirement for graduate students in the PAP doctoral programand for master's students in political science who select international relations as their primary field of specialization.

## PAP 690 - Research Design for Politics and Policy (4)

This course helps students understand the processes, design, and the philosophical foundations of research. The focus of this course is to train students to become researchers who can design professional-quality research, and write a research proposal that will satisfy the requirements for a doctoral dis sertation or grant proposal.
Cross-Listed as: This is the same course as PS 594 and may be taken only once for credit.

## PE - Physical Education

## PE 100 - Adapted Physical Activity (1)

This course is designed to individualize workouts for students with permanent or temporary physical dis abilities. This course can also be used to make accommodations for students enrolled in other PEcourses who have health or injury conditions which impact regular participation in the course.

## PE 101 - Gentle Yoga (1)

This course is designed forstudents who need a slowerpaced, less rigorous class: those with health issues, including but not limited to injuries, pregnancy, chronic illness; those who have not or do not exercise on a regular basis. Focus in this class will be on alignment; increasing flexibility and learning to work safely in each as ana (pose), using props to bring the pose to the student. Poses will be modified or variations of the pose will be taught based on students' needs.

## PE 102 - Gentle Tai Chi (1)

Please contact the department for a course description.

## PE 103 - Relaxation Yoga (1)

The gentle practice of mind/body integration allows for the development of strength, endurance, flexibility, and balance in a supportive and non-threatening atmo sphere. Through these practices the student is lead to greater health, renewed energy, and restored balance. We will be exploring various different techniques to bring about greater relaxation and awareness. Class will include res torative yoga, somatics, yoga nidra and gentle movements. This course is designed to attempt to meet your individual needs with gentle yoga poses and breaths that focus on restoring and maintaining health. If you have an individual need, be sure to discuss it with me and sit close to the front. Usually, any pose can be adapted to accommodate individual needs.

## PE 104 - Meditation (1)

Meditation is oftenhelpful in reducing stress, dis covering inner resources for peace of mind, healing, creativity, and calming of spirit. Meditation is a universal, health-giving resourceused forhundreds of years and in most cultures. This course will introduce the student to different methods of meditation, including gazing, imagery, breathing, mindfulness and other methods.

## PE 105-Yoga (1)

Yoga is an ancient philosophy, one of six, from India. Originating in the oral tradition, there are 196 sutras or threads - short statements which explain the philosophy of Yoga - written by Patanjali. The word yogameans union, to bring together the mind, body, and spirit. There are eight as pects of yoga: Yama (universal moral commandments), Niyama (personal disciplines), As anas (practice of the poses), Pranayama (rhythmic controlled breathing), Pratyahara (withdrawal of the senses), Dharana (concentration), Dhy ana (meditation), and Samadhi (a state of super-consciousness orbliss). This course will explore these different aspects of the yoga experience, looking into the meanings and practice of each and its role in yoga

## PE 112 - Tai Chi Chuan 24 Forms (1)

Tai Chi Chuan is one of the most popular and influential Chinese martialarts (Wu Shu). It is composed of slow, gentle and constant body movements. This 24-posture Tai Chi Chuan formis based on Yang style TaiChi, also known as a moving meditation. Practitioners performa series of postures designed to achieve balance and harmony in both body and mind, as well as to improve overall health.

## PE 119-Zumba (1)

This course provides the student with the opportunity to participate in Zumba ${ }^{\circledR}$ Fitness for credit. Are you ready to party yourself into shape? That's exactly what the Zumba® programis all about. It's an exhilarating, effective, easy-tofollow, Latin-ins pired, calorie-burning dance fitnessparty ${ }^{\mathrm{TM}}$ that's moving millions of people toward joy and health. Zumba Fitness® is the only Latin-inspired dancefitness programthat blends red-hot international music, created by Grammy Award-winning producers, and contagious steps to forma "fitnes s-party" that is downright addictive. Since its inception in 2001, the Zumba program has grown to become the world's largest - and most successful-dance-fitness programwith more than 14 million people of all shapes, sizes and ages taking weekly Zumba classes in over 140,000 locations across more than 150 countries.

## PE 120 - Barre Fitness (1)

Barre Fitness combines the Pilates philosophy with traditional ballet barre choreography to create a fun, highenergy sculpting class that tones, strengthens and stretches the entire body uniformly. This class challenges the body's range of motion with balance work, high repetitions, weights, balls and bands. Much of this class is performed on relev (tip toe) and in plie (bent knees). This class is open to multiple levels, as modifications are available.

## PE 121 - Cardio Kickboxing (1)

This fast paced exercise class combines real kickboxing techniques to modern dance beats for a great workout. Cardio kickboxing is a group-led class which uses a combination of martial arts kicks, punches, strength and cardio training to help reach streng th and endurance goals. This class offers an intense, high impact workout which incorporates basic self-defense actions. Cardio-kickboxing is rated as the \#1 calorie-burning workout, with the potential to burn 600-800 calories per hour of activity. This class targets all the major muscle groups of the body for an incredibly effective workout while reducing stress and improving self-confidence.

## PE 122 - Body Weight Boot Camp (1)

This course utilizes HIIT (high intensity interval training) incorporating bodyweight exercises. This course provides the ultimate workout forcardio and fat burning. HIIT is an intense interval training circuit that gets the body's major muscle groups involved through a series of repeated bodyweight exercises. With high intensity exercise, your body continues to burn fat long after your workout is complete. This class is super effective and is the perfect workout to burn calories, strengthen and lengthen your body.

## PE 124 - Abs and Lower Body (1)

Abs and Lower Body is a group-ledexercise class designed to improve muscle strength and tone in your core and lower body. You will see a wide range of exercises and performdifferent levels of squats, lunges, lower body, back and abdominal exercises, as well as high-intensity exercises such as jump-roping, running, and stair climbing. This is an advanced levelclass, but modifications are available. When the weather is nice, the clas s goes outside.

## PE 125 - Body Sculpt (1)

This course emphasizes muscular endurance training for the upper body, lower body, and abdominals. In a typical ses sion, we use dumbbells, soft weights, tubing, steps, small medicine balls, and body resistance to challenge every major muscle group in the body. This class is an excellent choice for participants who get plenty of cardiovascular training through other activities and want to concentrate on muscular development.

## PE 127 - Flex Fitness (1)

This course provides the student with the flexibility for self-paced and self-directed participation in the Physical

Education courses offered at PSU. With the freedomto select the activity, day and time from the attached list of approved coursed, the options are almost limitless. The student can attend an activity once or they may choose to stick with the same class throughout the entire term. The choice is completely up to themand their schedule(s). Simply select the desired activity, check with the ins tructor of the chosen activity before participating and present attached attendance record formand join the activity (given space available). No more stressing about missing class to meet with classmates or instructors - just choose an alternate activity, date or time. This class is available as a 1 or 2 credit option.

## PE 128 -Weight Training (1)

This class gives instruction and practice in the use of resistance machines, free weights and other training implements. It is a self-paced class and individual workout plans are expected. Instruction will be given on proper lifting techniqueand spotting. Students are requested to follow a routine in order to achievebest results. Students can proceed on their own or arrange a time to design a programwith the instructor. All weight roomrules will be strictly enforced.

## PE 129 - Fitness Conditioning (1)

Achieve a higher level of physical fitness for a longer, healthier lifespan. A fun, moderate-impact cardio routine that will leave you feeling lean and mean, Fitness Conditioning is designed to transformyour body to an entirely new fitness level. Each clas s session will utilize a variety of cardiovascular activities, targeted strength and bodyweight exercises to prevent injuries and avoid plateaus while improving all areas of your physical fitness.

## PE 131 -Sports Conditioning (1)

This course includes sport specific training for a multitude of sports, including plyometric training, speed and agility training, res is tance training, and different modes of aerobic training. Sports Conditioning focuses on how to train different types of athletes, as well as teaching how each specific type of training is related to the sport/event involved. This is a high intensity exercise course.

## PE 132 -Weight Loss Boot Camp (1)

Weight Loss Boot Camp (WLBoot Camp) is a group fitness class, which includes high impact exercises and for an intense workout. The class uses body sculpting, muscular endurance, and cardiovascular endurance activities to enhance weightloss goals. The class will incorporate squats, lunges, stair climbing, running,
jumping, side stepping, push-ups, and dips, in a wide variety of combinations to preserve muscle mass while you lose weight.

## PE 135-Pilates 1: Streng th andForm (1)

Students learn the structure, technique and form of Pilates, while awakening and strengthening the deep muscular skeletal system.

## PE 136 - Pilates Fusion (1)

Combining The Pilates form with aspects of internal martial arts, yogaand release technique, students learn to activate their center through complex movement patterning, breath and mindfulness practices.

## PE 137 - Pilates 2: Mindful Movement Flow (1)

Combining the Pilates form with aspects of internal martial arts, yoga and release technique, students learn to activate their center through complexmovement patterning, breath and mindfulness practices.

## PE 140 -Self Defense (1)

This class is reality based: we will teach what works best to defend against threats to your life and body in the real world. The training exposes you to simulated verbal attacks fromobnoxious bar patrons, vulg ar street thugs and the common irate, shopper who gets in your face and starts cussing a blue streak in the parking lot. As a reality based class the students are presented with live simulations which forces one to function even while jacked up on adrenaline. Since the adrenal rush is an instinctual reaction to stres s, the trick is learning to harness and focus all that power into one's defenseby using tools that don't require size or streng th for the average person. Preferred strategy: remain cognizant of surrounding at all times. This increases our chance of being successful and fluctuates from day to night.

## PE 144 - Judo (1)

In the study of Judo, you will learn techniques in falling, throwing and grappling to aid in self-defense. Judo will improve yours trength, agility and overall aerobic capacity. Judo utilizes virtually every muscle of the body and is an excellent overall conditioner. This discipline promotes a confidence that affects one's entire life.

## PE 145 - Brazilian Jiu-Jitsu I (1)

Brazilian Jiu-Jitsu is an advanced form of the Japanese martial art of the same name. It has been modified by the Brazilians to become "arguably the mosteffective martial art in the world." The formof Jiu-Jitsu the Brazilians created is a Martial Art that is designed to adapt to any type of Fighting Style or Martial Art, making it reality based. This is a tes ted and proven style, art, and science. With the arrival of Brazilian Jiu-Jitsu on the martial arts scene, it has foreverchanged the way fighters train. Brazilian Jiu-Jitsu offers a complete sy stemof self-defense that works whether you are big and strong or small of frame. Because of the principles of leverage thatBrazilian Jiu-Jitsu is founded upon, a practitioner could pursue it throughout their lifetime. Brazilian Jiu-Jitsu is beneficial in helping maintain cardiovascular fitness and the integrity of bones and muscles, thus keeping you fit and youthful.

## PE 146 - Brazilian Jiu-Jitsu II (1)

Review the bas ic fundamentals of Brazilian Jiu-Jitsu and refine your skills. Students will learn to identify their strengths and improve upon their weakness. (See the class description for Brazilian Jiu-Jitsu for more detail).

## PE 149 - Aqua Fitness (1)

## PE 160 - Argentine Tango (1)

An introduction to the beautiful dance of Argentine Tango, known to be a dance of passion and grace. Argentine tango is a highly individualistic and improvisational dance, with endless possibilities for expressing the music. A true socialdance, based on the art of leading and following, students will find it to be everexciting, challenging and fun. In this class students will explore both the close embrace and open embrace, "Milonguero" and "Salon" styles and movements of tango. Music education will include a wide variety of traditional clas sical tango orchestras as well as popular alternative tango music. Variations of movement and the depth of emotion and expression will be explored in traditional tango, fast paced playful Milonga, and the elegant Vals. Tango is a dance of present moment connection and zen, highly addictive, and a worth while adventure

## PE 161 -S wing Dance (1)

Swing dance, sometimes referred to as " sophisticated swing", is a slotted swing dance, using techniques of connection through body positions that create extension/ leverage, compression, and elasticity controlling momentumto create amazing lead and follow options. It is a playful and wonderful dance, with much roomfor
improvisation and self-expression. Using many rhythm variations, syncopations, slides, and stops, West Coast swing allows dancers a lot of freedomto play with their own pers onality and be creative with the music on the dance floor.

## PE 162 - Beginning Belly Dance (1)

This course will focus on the movement technique of popular styles of belly dance and related traditional dances. An emphas is will be placed on understanding the complexity of the rhythms and how they relate to the dance movement.

## PE 163 - BallroomDance (1)

A fun dance class created to introduce you to the joy of social ballroomdancing Each termstudents will explore the 6 most popular ballroom dance styles: W altz, Rumba, Foxtrot, Tango, Swing ChaCha. Time permitting, we may also explore more other styles of Ballroom, Viennese Waltz, Quickstep, Samba, Bolero, Jive or Paso Doble. Developing a new appreciation and skill set for the art of lead/follow, connection with your partner, and the necessary posture, technique styling to create each dance style developed for expres sing the music. Students will learn mini-routines in each dance style taught for social dancing success and students may choose to showcase what they learn and perform at local venues, sharing the joy of ballroomdance with others

## PE 164 -Salsa and Social Latin (1)

An introduction to Sals a social Latin dancing. Focuses primarily on the popular social dance styles of today, including Salsa, Bachata, Cha-Cha, Merengue and Cumbia. Designed to bring success in social dancing. Emphas is on ?Club styling? used for the smaller, crowded, dance floors and the basic rhythm variations found in Latin music from cultures around the world.

## PE 165 - Dance Improv (1)

Practice the techniques, tools and training needed to cultivate the sensing, and imaginative body, and use them as a guide in movement patterns and dances, both individually and collectively. No prior dance experience required.

## PE 176 - Day Hiking (1)

Portland has numerous parks and a variety of neighborhood pedestrian paths to offer enjoyable exercise to residents and visitors. The course will introduce a
sample of day excursions between 4 to 8 miles in length on a variety of surfaces: as phalt, gravel, natural trails, flat, or hilly. The hikes in this course will be within 15-25 minutes of PSU. Hiking is a great way to improve cardiov ascular fitness while burning calories. Basic hiking principles, selecting appropriate paths for ability levels, and progression of difficulty will be the cornerstone of the course. Since hiking is a weight bearing exercise and low impact workout, it prevents osteoporosis while enjoying the outdoors.

## PE 177 -Hiking in the Columbia Gorge (1)

Portland as a city is privileged to have in close proximity the Columbia Gorge. Within 30-45 minutes it offers numerous hiking trails (long short) of all levels for enjoyment and exercise in the outdoors. This course will introduce light hiking day excursions between 3 to 5 miles in length which will provide walking fitness, but als ofocus on waterfalls, geology, Oregonhistory, animal habitats, flora and fauna.

## PE 181 - Varsity Sports (1)

Please contact the department for a course description.

## PE 193 - Fitness Instruction: Adapted Physical Education (2)

Please contact the department for a course description.

## PE 194 -Fitness Instruction: Personal Training (2)

Please contact the department for a course description.

## PE 227 -Flex Fitness (2)

This course provides the student with the flexibility for self-paced and self-directed participation in the Physical Education courses offered at PSU. W ith the freedomto select the activity, day and time from the attached list of approved coursed, the options are almost limitless. The studentcan attend an activity once or they may choose to stick with the same class throughout the entire term. The choice is completely up to themand their schedule(s). Simply select the desired activity, check with the instructor of the chosen activity before participating and present attached attendance record formand jo in the activity (given space available). No more stressing about missing class to meet with clas smates or instructors - just choose an alternate activity, date or time. This class is available as a 1 or 2 credit option.

## PE 230-(4)

## PE 280 - Physical Education Service Courses: Women

 (2)A variety of activities taught for physiological and recreational values. Two hours per week plus field trips and extended experiences.

## PE 281 - Viking Experience (2)

Please contact the department for a course description.

## PE 281L - Lab for PE 281 (0)

Please contact the department for a course description.

## Per - Persian

## Per 101 - First-Year Persian Term 1 (4)

Introduction to spoken and written Persian. Grammar, reading, and simple conversation. This is the first course in a sequence of three: Per 101, Per 102, and Per 103.

## Per 102 - First-Year Persian Term 2 (4)

Introduction to spoken and written Persian. Grammar, reading, and simple conversation. This is the second course in a sequence of three: Per 101, Per 102, and Per 103.

## Per 103 - First-Year Persian Term3 (4)

Introduction to spoken and written Persian. Grammar, reading, and simple conversation. This is the third course in a sequence of three: Per 101, Per 102, and Per 103.

Per 199 -Special Studies (1-6)
(Credit to be arranged.)

## Per 201 -Second-Year Persian Term1 (4)

Graded readings in the modern literary language. Conversation and prose composition. This is the first course in a sequence of three: Per 201, Per 202, and Per 203. Recommended prerequis ite: Per 103.

Per 202 - Second-Year Persian Term 2 (4)
Graded readings in the modern literary language. Convers ation and prose composition. This is the second course in a sequence of three: Per 201, Per 202, and Per 203. Recommended prerequisite: Per 103.

## Per 203 - Second-Year Persian Term 3 (4)

Graded readings in the modern literary language. Convers ation and prose composition. This is the third course in a sequence of three: Per 201, Per 202, and Per 203. Recommended prerequisite: Per 103.

## Per 299 - Special Studies (1-12)

(Credit to be arranged.)

## Per 301 - Third-year Persian (4)

Reading in literature, composition, expository writing, and conversation. This is the first course in a sequence of two: Per 301 and Per 302. Recommended prerequisite: Per 203.

## Per 302 - Third-year Persian (4)

Reading in literature, composition, expository writing, and conversation. This is the second course in a sequenceof two: Per 301 and Per 302. Recommended prerequisite: Per 203.

## Per 330U- Persian Culture and Civilization (4)

A multimedia survey of major aspects of 2500 years of Persian civilization including traditions, art, music, architecture, handicrafts, literature, cities, and sports. Reflects Persian culture fromthe glories of Iran's past to contemporary scenes of rural life. Taught in English.

## Per 341 - Introduction to Persian Literature (4)

Selected texts fromclassical and modern Persian poetry and prose including epic, lyric, and mystic traditions placed in historical contexts. Covers the most important genres such as the Qasida, the Ghazal, the Ruba'i and the Masnavi. Expected preparation: Per 302.

Per 399 - Special Studies (1-4)
(Credit to be arranged.)

## Per 401 -Research (1-6)

(Credit to be arranged.)

## Per 404 -Cooperative Education/Internship (1-12)

(Credit to be arranged.)

## Per 409 - Practicum(1-4)

(Credit to be arranged.)

## Per 410 -Selected Topics (1-6)

(Credit to be arranged.)

## Ph - Physics

## Ph 101 -Essentials of Physics (4)

An elementary introduction to the basic principles of physics, their interpretation and application. Designed to accommodate all liberal arts students. This is the first course in a sequence of two: Ph 101 and Ph 102.
Concurrent enrollment in $\mathrm{Ph} 104,105$ is encouraged. Recommended prerequis ite: high school algebra.

## Ph 102 - Essentials of Physics (4)

An elementary introduction to the basic principles of physics, their interpretation and application. Designed to accommodate all liberal arts students. This is the second course in a sequence of two: Ph 101 and Ph 102.
Concurrent enrollment in $\mathrm{Ph} 104,105$ is encouraged. Recommended prerequis ite: high school algebra.

## Ph 104 -Experimental Investigations for Non-science Majors (2)

Dis covery labs for essential laws of physics. Investigate gravity, force, acceleration, momentum, heat, work, energy, electricity, light, and radioactivity. Make simple electrical circuits and an electrical motor. Improve computer literacy by working with graphic models of radioactive decay. This is the first course in a sequence of two: Ph 104 and Ph 105 . One two-hour discussion and laboratory period. Concurrent enrollment in $\mathrm{Ph} 101,102$ is encouraged. Recommended prerequisite: high school algebra.

## Ph 105 - Experimental Investigations for Non-science Majors (2)

Dis covery labs for es sential laws of physics. Investigate gravity, force, acceleration, momentum, heat, work, energy, electricity, light, and radioactivity. Make simple electrical circuits and an electrical motor. Improve computer literacy by working with graphic models of radioactive decay. This is the second course in a sequence of two: Ph 104 and Ph 105 . One two-hour discussion and laboratory period. Concurrent enrollment in $\mathrm{Ph} 101,102$ is encouraged. Recommended prerequisite: high school algebra.

## Ph 121 - General Astronomy (4)

An introductory his torical, descriptive, and interpretative study of as tronomy. Emphasis on the basic scientific methods as they apply to as tronomical problems. Detailed examination of the earth, followed by a survey of the other members of the solar system. Survey of the stars, their types, grouping, and motions. Models for the evolution of the Universe and the possibility of life elsewhere. The nature of light, the types of information it carries, and the types of devices used to detect it. This is the first course in a sequence of two: Ph 121 and Ph 122 which need not be taken in sequence.

## Ph 122 - General Astronomy (4)

An introductory his torical, descriptive, and interpretative study of as tronomy. Emphasis on the basic scientific methods as they apply to as tronomical problems. Detailed examination of the earth, followed by a survey of the other members of the solars ystem. Survey of the stars, their types, grouping, and motions. Models for the evolution of the Universe and the possibility of life elsewhere. The nature of light, the types of information it carries, and the types of devices used to detect it. This is the second course in a sequence of two: Ph 121 and Ph 122 which need not be taken in sequence.

## Ph 199 - Special Studies (1-3)

(Credit to be arranged.)

## Ph 201 - General Physics (4)

Introductory physics for science majors. The student will explore topics in physics including Newtonian mechanics, electricity, and magnetism, thermal physics, optics, and modern physics. This is the first course in a sequence of three: $\mathrm{Ph} 201, \mathrm{Ph} 202$, and Ph 203 and must be taken in sequence.

Prerequisite: Mth 112 or Mth 251 or Aleks Placement Test score 76 or higher. Corequisite: Ph 214.

## Ph 202-General Physics (4)

Introductory physics for science majors. The student will explore topics in physics including Newtonian mechanics, electricity, and magnetism, thermal physics, optics, and modern physics. This is the second course in a sequenceof three: Ph 201, Ph 202, and Ph 203 and must be taken in sequence.
Prerequisite: Ph 201 or Ph 231 . Corequisite: Ph 215.

## Ph 203 -General Physics (4)

Introductory physics for science majors. The student will explore topics in physics including Newtonian mechanics, electricity, and magnetism, thermal physics, optics, and modern physics. This is the third course in a sequence of three: Ph 201, Ph 202, and Ph 203 and must be taken in sequence.
Prerequisite: Ph 202 or Ph 232 . Corequisite: Ph 216.

## Ph 211 - General Physics (with Calculus) I(4)

Introductory physics for students majoring in science and engineering. The student will explore statics and dynamics using the methods of calculus. This is the first course in a sequence of three: $\mathrm{Ph} 211, \mathrm{Ph} 212$, and Ph 213 and must be taken in sequence.
Prerequisite: Mth 251. Corequisite: Ph 214.

## Ph 212 - General Physics (with Calculus) II (4)

Introductory physics for students majoring in science and engineering. The student will explore topics in electricity and electromagnetismusing the methods of calculus. This is the second course in a sequence of three: $\mathrm{Ph} 211, \mathrm{Ph}$ 212, and Ph 213 and must be taken in sequence.

Prerequisite: Ph 211 and Mth 252. Corequisite: Ph 215.

## Ph 213 - General Physics (with Calculus) III (4)

Introductory physics for students majoring in science and engineering. The student will explore topics in thermodynamics, and optics using the methods of calculus. This is the third course in a sequence of three: $\mathrm{Ph} 211, \mathrm{Ph}$ 212, and Ph 213 and must be taken in sequence.
Prerequisite: Ph 212 and Mth 252. Corequisite: Ph 216.
Ph 214 -Lab for Ph 201 or Ph 211 or Ph 221 or Ph 231 (1)

Introductory laboratory forstudents in General Physics (with Calculus). This is the first lab in a sequence of three: $\mathrm{Ph} 214, \mathrm{Ph} 215$, and Ph 216 . One 3-hour laboratory period.
Prerequisite: Concurrent enrollment in $\mathrm{Ph} 201, \mathrm{Ph} 211, \mathrm{Ph}$ 221, or Ph 231.

Ph 215 - Lab for Ph 202 or Ph 212 or Ph 222 or Ph 232 (1)

Introductory laboratory for students in General Physics (with Calculus). This is the second lab in a sequence of three: Ph 214, Ph 215, and Ph 216. One 3-hour laboratory period.
Prerequisite: Concurrent enrollment in $\mathrm{Ph} 202, \mathrm{Ph} 212, \mathrm{Ph}$ 222, or Ph 232.

## Ph 216 - Lab for Ph 203 or Ph 213 or Ph 223 or Ph 233

 (1)Introductory laboratory for students in General Physics (with Calculus). This is the third lab in a sequence of three: Ph 214, Ph 215, and Ph 216. One 3-hour laboratory period.
Prerequisite: Concurrent enrollment in Ph 203 , Ph 213 , Ph 223, or Ph 233.

## Ph 221 - General Physics (with Calculus) I(3)

Introductory physics for students majoring in engineering. The student will explore topics in statics and dynamics using the methods of calculus. This is the first course in a sequence of three: $\mathrm{Ph} 221, \mathrm{Ph} 222$, and Ph 223 and must be taken in sequence.
Prerequisite: Mth 251. Corequisite: Ph 214.
Ph 222 - General Physics (with Calculus) II (3)
Introductory physics for students majoring in engineering. The student will explore topics in electricity and electromagnetismusing the methods of calculus. This is the second course in a sequence of three: $\mathrm{Ph} 221, \mathrm{Ph} 222$, and Ph 223 and must be taken in sequence.
Prerequisite: Ph 221 and Mth 252. Corequisite: Ph 215.

## Ph 223 - General Physics (with Calculus) III (3)

Introductory physics for students majoring in engineering. The student will explore topics in thermody namics, and optics using the methods of calculus. This is the third course in a sequence of three: $\mathrm{Ph} 221, \mathrm{Ph} 222$, and Ph 223 and must be taken in sequence.

Prerequisite: Ph 222 and Mth 252. Corequisite: Ph 216.

## Ph 231 - General Physics I with Life Science and Medical Applications (4)

This is a generalphysics course with a focus on life science and medical applications. In Ph 231 students explore mechanics. This is the first course in a sequence of three: Ph 231 , Ph 232 , and Ph 233 and it is recommended they be taken in this order.
Prerequisite: MTH 111 or Mth 251 or Aleks Placement Test score 76 or higher. Corequisite: Ph 214.

## Ph 232 -General Physics II with Life Science and Medical Applications (4)

This is a general physics course with a focus on life science and medical applications. In Ph 232 students explore fluids and electromagnetis $m$. This is the second course in a sequence of three: $\mathrm{Ph} 231, \mathrm{Ph} 232$, and Ph 233 and it is recommended they be taken in this order.
Prerequisite: Ph 201 or Ph 231. Corequisite: Ph 215.
Ph 233 - General Physics III with Life Science and Medical Applications (4)
This is a general physics course with a focus on life science and medical applications. In Ph 233 students explore thermodynamics, waves and optics. This is the third course in a sequence of three: $\mathrm{Ph} 231, \mathrm{Ph} 232$, and Ph 233 and it is recommended they be taken in this order.
Prerequisite: Ph 202 orPh 232. Corequisite: Ph 216.
Ph 234 -Lab for General Physics I with Life Science and Medical Applications (1)
This is a general physics lab course with a focus on life science and medical applications. Students conduct lab exercises exploring mechanics and thermalphysics. This is the first course in a sequence of three: Ph 234, Ph 235, and Ph 236 and it is recommended they be taken in this order.
Prerequisite: Mth 112 or Aleks Placement Test at $75 \%$. Corequisite: Ph 231.
Ph 235 -Lab for General Physics II with Life Science and Medical Applications (1)
This is a general physics lab course with a focus on life science and medical applications. Students conduct lab exercises exploring fluids and electromagnetism. This is the second course in a sequence of three: Ph 234, Ph 235, and Ph 236 and it is recommended they be taken in this order.
Prerequisite: Mth 112 or Aleks Placement Test at $75 \%$. Corequisite: Ph 232.

## Ph 236 -Lab for General Physics III with Life Science and Medical Applications (1)

This is a general physics lab course with a focus on life science and medical applications. Students conduct lab exercises exploring waves andoptics. This is the third course in a sequence of three: $\mathrm{Ph} 234, \mathrm{Ph} 235$, and Ph 236 and it is recommended they be taken in this order.
Prerequisite: Mth 112 or Aleks Placement Test at $75 \%$. Corequisite: Ph 233.
Ph 274 - Workshopfor PH 231 General Physics I with Life Scienceand Medical Applications (1)
Optional peer-led problem-solving sessions designed to promote the success of students in $\mathrm{Ph} 231, \mathrm{Ph} 232$, Ph 233

General Physics with Life Science and Medical Applications sequence.
Corequisite: Concurrent enrollment in Ph 231 required.
Ph 275 - Workshopfor PH 232 General Physics II with Life Scienceand Medical Applications (1)

Optional peer-led problem-solving sessions designed to promote the success of students in Ph 231, Ph 232, Ph 233 General Physics with Life Science and Medical Applications sequence.
Corequisite: Concurrent enrollment in Ph 232 required.
Ph 276 - Workshopfor PH 233 General Physics III with Life Science and Medical Applications (1)

Optional peer-led problem-solving sessions designed to promote the success of students in Ph 231 , Ph 232 , Ph 233 General Physics with Life Science and Medical Applications sequence.
Corequisite: Concurrent enrollment in Ph 233 required.

## Ph 284 - Workshopfor Ph 201 General Physics (1)

Optional peer-led problem-solving sessions designed to promote the success of students in Ph 201, Ph 202, Ph 203 general physics sequence. Concurrent enrollment: corresponding lecture course $\mathrm{Ph} 201, \mathrm{Ph} 202$, Ph 203. Pass/nopass only.
Prerequisite: Concurrent enrollment in Ph 201.
Ph 285 - Workshopfor Ph 202 General Physics (1)
Optional peer-led problem-solving sessions designed to promote the success of students in Ph 201, Ph 202, Ph 203 generalphysics sequence. Concurrent enrollment: corresponding lecture course Ph 201, Ph 202, Ph 203. Pass/nopass only.
Prerequisite: Concurrent enrollment in Ph 202.
Ph 286 - Workshopfor Ph 203 General Physics (1)
Optional peer-led problem-solving sessions designed to promote the success of students in Ph 201, Ph 202, Ph 203 general physics sequence. Concurrent enrollment: corresponding lecture course $\mathrm{Ph} 201, \mathrm{Ph} 202$, Ph 203. Pass/nopass only.
Prerequisite: Concurrent enrollment in Ph 203.
Ph 294 - Workshopfor Ph 211/221 General Physics (with Calculus) (1)
Optional peer-led problem-solving sessions designed to promote the success of students in $\mathrm{Ph} 211, \mathrm{Ph} 212, \mathrm{Ph} 213$ OR Ph 221, Ph 222, Ph 223 general physics sequence. Concurrent prerequisite: corresponding lecture course Ph 211 orPh 221, Ph 212 or Ph 222, Ph 213 or Ph 223. Pass/nopass only.
Prerequisite: Concurrent enrollment in Ph 211 or Ph 221.

## Ph 295 - Workshopfor Ph 212/222 General Physics (with Calculus) (1)

Optional peer-led problem-solving sessions designed to promote the success of students in $\mathrm{Ph} 211, \mathrm{Ph} 212, \mathrm{Ph} 213$ OR Ph 221, Ph 222, Ph 223 general physics sequence. Concurrent prerequisite: corresponding lecture course Ph 211 or Ph 221, Ph 212 or Ph 222, Ph 213 or Ph 223. Pass/no pass only.
Prerequisite: Concurrent enrollment in Ph 212 or Ph 222.

## Ph 296 - Workshopfor Ph 213/223 General Physics (with Calculus)(1)

Optional peer-led problem-solving sessions designed to promote the success of students in $\mathrm{Ph} 211, \mathrm{Ph} 212, \mathrm{Ph} 213$
OR Ph 221, Ph 222, Ph 223 general physics sequence. Concurrent prerequisite: corresponding lecture course Ph 211 or Ph 221, Ph 212 or Ph 222, Ph 213 or Ph 223. Pass/nopass only.
Prerequisite: Concurrent enrollment in Ph 213 or Ph 223.

## Ph 299 -Special Studies (1-8)

(Credit to be arranged.)

## Ph 311 - Introduction to Modern Physics I (4)

The revolution in the concepts of physics in the early 20th century. Quanta, black-body radiation, relativity, Bohr's theory of the atom. Introduction to quantummechanics. This is the first course in a sequence of two: Ph 311 and Ph 312 and must be taken in sequence. Expected preparation: Mth 253.
Prerequisite: Mth 252, Ph 203 or Ph 213.

## Ph 312 - Introduction to Modern Physics II (4)

The revolution in the concepts of physics in the 20th century. Radioactivity, introduction to quantum mechanics. Atomic, molecular spectroscopy, periodic table. Introduction to nuclear and solid state physics, and elementary particles. This is the second course in a sequence of two: Ph 311 and Ph 312 and must be taken in sequence.
Prerequisite: Ph 311.

## Ph 314 -Experimental Physics I(4)

Experiments in electrical measurements, digital logic circuits with applications to experimental control and computer interfacing, and analog circuits. Two 3-hour lab periods. This is the first course in a sequence of three: Ph 314, Ph 315 and Ph 316.

## Ph 315 - Experimental Physics II(4)

Experiments in electrical measurements, digitallogic circuits with applications to experimental control and computer interfacing, and analog circuits. Two 3-hour lab periods. This is the second course in a sequenceof three: Ph 314, Ph 315 and Ph 316.

## Ph 316 - Experimental Physics III (4)

Students will performseveral experiments illus trating quantumand relativistic effects. The emphasis will be on computer-assisted experimentation and data analysis. Experiments will include instrumentation and counting in nuclear physics, measurement of band gap in semiconductors, meas urement of ratio of electron charge to electron mass, speed of light, Frank-Hertzexperiment and electron spin resonance. Two 3-hour laboratory periods. This is the third course in a sequence of three: $\mathrm{Ph} 314, \mathrm{Ph}$ 315 and Ph 316 . Expected preparation: Ph 311.

## Ph 319 - SolidState Physics for Engineering Students

 (4)Survey of solid state physics including topics necessary for understanding crystalline solids and their electron transport processes. Topics includecrystal lattices, x-ray diffraction, concepts of quantumphysics, the Schrodinger equation, electron tunneling, physical statistics, the free electron theory of metals, periodic potentials, semiconductors, and superconductors. Recommended prerequisite: Ph 213 or 223.

## Ph 321 - Current Electricity (4)

Electric potential and current; Kirchoff's Laws and equivalent circuits. Transient and A.C. behavior of circuit elements. Theory of operation of diodes and transistors. Recommended prerequisites: Ph 203 or 213; concurrent enrollment in Ph 314.

Corequisite: Ph 314.

## Ph 322 - Computational Physics (4)

Formulation and numerical solution of physics problems. Use of computers and graphical dis plays to enhance intuition and supplement analytical procedures. Approaches to complexphysical situations, especially those involving dissipative, nonlinear and stochastic phenomena. Recommended prerequisite: Working knowledge of at least one computer language.

## Ph 331 - Physics of Music (4)

A series of lectures and laboratories illustrating the basic principles of acoustics and their application to string, wind,
brass, and percussion/instruments. Some of the laboratory exercises are adaptable for use in primary and secondary school classes. Recommended prerequisite: one year of music, or one year of a physical science.

## Ph 333U- Weather (4)

Introductory course in the atmospheric environment providing a comprehensive unders tanding of atmospheric structure and the changes overtime that result in the weather we experience. Topics include: atmospheric moisture (fog, rain, clouds), atmos pheric stability and cloud development, air pres sure and winds, air masses and fronts, and hurricanes and tornadoes. This course is the same as Geog 333U; course may be taken only once for credit. Recommended: upper division standing or Geog 210.

Cross-Listed as: Geog 333U.

## Ph 335U - Wacky or Real: What Everyone Should Know About Physics Scams (4)

The use and misuse of physics: beginning with a firm understanding of the strengths and weaknesses of the scientific method, analyzes how people veer away fromit, resulting in pathological, junk, pseudo and fraudulent physics. Examples such as magnetic therapy, perpetual motion, ESP, X-ray cures, and astrology are included. Recommended prerequis ites: upper division standing.

## Ph 337 -Physics in Biomedicine (4)

The physics behind the most important medical instruments and technologies. A wide range of concepts from electromagnetism, optics, to quantummechanics are used to explain the mechanisms behindultrasound, endoscopy, optical microscopy, EKG, pacemaker, defibrillators,LASER eye surgery, microscopy, x-ray, radiation, CAT scan, PET scan, MRI, and more. Expected preparation: $\mathrm{Ph} 201,203$ or Ph 101, 102.

## Ph 353U- Radiation in the Environment (4)

Examines sources of radiation and the hazards they represent. Students will explore the interaction of radiation with matter, including living tissue, and examine dos age and risk assessment. Topics include: fundamentals of electromagnetic radiation, nuclei and radioactive decay; cosmic background radiation and radon gas; nuclear chain reactions and atomic weapons; nuclear power generation, waste disposal and nuclear dis asters; medical x-rays and non-ionizing radiation frommicrowaves and cellular phones.

Prerequisite: Upper-division standing. Cross-Listed as: This is the same course as Sci353U and may be taken only once for credit.

## Ph 361U- General Astronomy I (4)

An introduction to the history of astronomy, the nature of light, telescopes, and an examination of the Earth and other planets both within and outside of the solar system. Emphasis on basic scientific methods, including relationships found through ratios, powers, and a few square roots. Includes laboratory. This is the first course in a sequence of two: Ph 361 U and Ph 362 U .

Cross-Listed as: Sci315U.

## Ph 362U - General Astronomy II (4)

Survey of the sun, stars, black holes, galaxies, and the role of women in the study of cosmic evolution and structure. Emphasis on basic scientific methods, including relationships found through ratios, powers, and a few square roots. Includes laboratory. This is the second course in a sequence of two: Ph 361 U and Ph 362 U .

Cross-Listed as: Sci316U.

## Ph 365 - Fractals, Chaos, and Complexity (4)

Introduction to the basic physical ideas behind fractals in nature, chaos, complexity, and other current concepts in physics, with emphasis on fractals and chaos. Computer simulations and desktop experiments involving fractals, chaos, and complex systems. Recommended prerequisite: astronomy, general physics, or Natural Science Inquiry.

## Ph 366U-Complexity and the Universe I (4)

Introduction to the basic physical ideas behind complexity and other current concepts in physics. Computer simulations and desktop experiments involving fractals, chaos, and complex sy stems. Includes laboratory and/or fieldwork. Recommended prerequisite: general physics or Natural Science Inquiry.

## Ph 367U-Complexity and the Universe II (4)

Continuation of Sci318/Ph 366. Emphasizes scientific cosmology with a focus on understanding how insights gained fromphysics and astronomy affect your view of the universe and your place in it. Students participate actively in seeing how some of the information was gathered, to help critically analyze what to believe about the history and arrangement of the universe and what it means to them. Includes laboratory and/or fieldwork. Recommended prerequisite: as tronomy, generalphysics, or Natural Science Inquiry.

## Ph 371 -Fractals, Chaos, Complexity, and Other Current Topics in Physics (4)

Introductory survey to current concepts in fractals in the natural world, chaos, complexity, and other related topics in physics. Computer simulations and the use of microcomputers, desktop experiments are an essential part of the course. Recommended prerequisite: one year of general physics.

## Ph 375U - Climate Change and Human Life (4)

An introduction to the global environment and how human activities are causing climatic changes, ozone depletion, and deforestation. Emphasizes the interrelationship between environmental processes. Deals with the qualitative aspects of how the earth's climate works, how it can be altered by burning of fossil fuels (emis sions of carbon dioxide) and by the increasing concentrations of other "greenhouse gases"; how the ozone layer can be depleted by man-made chemicals, and what is being done, or can be done to avert the undesirable consequences of these global changes.

## Ph 378U-Science Through Science Fiction (4)

This class uses sciencefiction literature to examine a wide variety of topics in science. Recommended prerequisites: as tronomy, general physics, orNatural Science Inquiry. Also listed as Sci355; course may be taken only once for credit.

## Ph 382U- Introduction to Nanoscience and Nanotechnology (4)

Basic introduction to nanoscience and nanotechnology for all interested science, en gineering and social science and humanities students. This is the same course as Sci382U and may be taken only once for credit.

Cross-Listed as: Sci 382 U .

## Ph 384 -From Contemporary Nanoscience Towards Sustainable Nanotechnologies (4)

Provides an overview of nanoscience/technology, its interdisciplinarity, how it complements biomedical, engineering, economic, and environmental studies and gives students an appreciation of why "soft" machines are favored over "hard" machines. As second part of Ph 382U (cross listedSci382U), it provides a scientific/technological basis for sustainable future technology developments.

Cross-Listed as: This is the same course as Sci 384 and may be taken only once for credit. .

## Ph 399 - Special Studies (0-6)

(Credit to be arranged.)

## Ph 401 - Research (1-6)

(Credit to be arranged.) Consent of instructor.

## Ph 402 - Independent Study (1-9)

(Credit to be arranged.)

Ph 404 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

## Ph 405 - Reading and Conference (1-6)

(Credit to be arranged.) Consent of instructor.

Ph 406 -Special Projects (0-9)
(Credit to be arranged.) Consent of instructor.

## Ph 407 - Seminar (0-6)

(Credit to be arranged.) Consent of instructor.

## Ph 408 - Workshop(1-12)

(Credit to be arranged.)

## Ph 410 - SelectedTopics (1-6)

(Credit to be arranged.) Consent of instructor.

## Ph 411 - Introduction to Quantum Mechanics (4)

An introduction to the formulation and application of wave mechanics; the Schrodingerequation and its application to time-independent problems (both one- and threedimensional problems); identical particles; approximation methods including mainly time-independent perturbations. Brief exploration of the potential applications of quantum mechanics to engineering: quantumnano-structures and quantumcomputers. Expected preparation: Ph 318 or 311, Mth 256.

Also offered for graduate-level credit as Ph 511 and may be taken only oncefor credit.

## Ph 412 - Quantum Mechanics II (4)

Introduction to the three-dimensional Schrodinger equation and applications such as band theory, selection rules, and molecules. The first half of the course will focus on exactly solvable models and analytic solutions. The second half will emphasize approximation methods in quantum mechanics, including perturbation theory, the variational principle, and the WKB approximation. The use of scientific software and modeling to solve quantum mechanical problems will be emphasized.
Also offered for graduate-level credit as Ph 512 and may be taken only once forcredit. Prerequisite: $\mathrm{Ph} 411, \mathrm{Ph} 311$, and Mth 256.

## Ph 413 - Introduction to SolidState Physics (4)

Experimental and theoretical survey of the lattice and electronic properties of solids with particularemphasis on the properties of electrons in semiconductors and modern materials. Expected preparation: Ph 411 or Ph 312.

Also offered for graduate-level credit as Ph 513 and may be taken only once forcredit. .Prerequisite: Upper division standing.

## Ph 415 - Experimental Optics (3)

Advanced experiments in physical optics. One 4-hour laboratory period. Expected preparation: Ph 203 or Ph 213.
Also offered for graduate-level credit as Ph 515 and may be taken only once for credit. .

## Ph 424 - Classical Mechanics I (4)

The Newtonian formulation of mechanics. Kinematics and dynamics of particles in inertial and accelerated reference frames. Conservation principles. Centralforces, gravitation, and celestial mechanics. Free and forced vibrations. Recommended prerequisites: Ph 203 or 213; Mth 256 previously or concurrently.

## Ph 425 - Classical Mechanics II (4)

Advanced formulation of mechanics. Lagrange's and Hamilton's equations. The inertial tensor, free rotations, and rigid body dy namics. Theory of small oscillations, coupled oscillations and normal modes. Expected preparation: Ph 424 and Mth 256.
Also offered for graduate-level credit as Ph 525 and may be taken only once forcredit. .

## Ph 426 - Thermodynamics and Statistical Mechanics (4)

Concepts of temperature, work, and heat; first and second laws of thermodynamics and applications; thermodynamic potentials; heat engines, Carnot cycle, and ideal gases; entropy and its statistical interpretation; kinetic theory of gases; classical and quantumstatistics; introduction to
statistical mechanical ensembles. Expected preparation: Ph 203 or Ph 213 , Mth 254, and Ph 311.

Also offered for graduate-level credit as Ph 526 and may be taken only once for credit. .

## Ph 431 - Electricity and MagnetismI (4)

Advanced study of electricity and magnetismcovering field and potentialof charge arrays, electrostatic field energy, images, multipoles, Laplace's equation, Biot-Savart and Ampere's laws, magnetic field energy, vector potential, displacement current, dielectrics and their microscopic models, electromagnetic wave equations, boundary conditions, energy radiation, magnetic materials and their microscopic models. This is the first course in a sequence of two: Ph 431 and Ph 432 . Expected preparation: Ph 312 and Mth 256.

Also offered for graduate-level credit as Ph 531 and may be taken only once for credit. .

## Ph 432 - Electricity and Magnetism II (4)

Advanced study of electricity and magnetismcovering field and potentialof charge arrays, electrostatic field energy, images, multipoles, Laplace's equation, Biot-Savart and Ampere's laws, magnetic field energy, vector potential, displacement current, dielectrics and their microscopic models, electromagnetic wave equations, boundary conditions, energy radiation, magnetic materials and their microscopic models. This is the second course in a sequence of two: Ph 431 and Ph 432 . Expected preparation: Ph 312 and Mth 256.
Also offered for graduate-level credit as Ph 532 and may be taken only once for credit. .

## Ph 434 - Methods of Mathematical Physics (4)

A survey of methods of applied mathematics used in modern physics, to include: vectors, matrices, operators, and eigen values; perturbation theory and series expansion; variation and optimization; numericalmethods; transforms; and special functions. Expected preparation: Ph 312 and Mth 256.
Also offered for graduate-level credit as Ph 534 and may be taken only once for credit. .

## Ph 440 - Physics of SolidState Devices (4)

This is a survey intended to provide the foundation neces sary for understanding of function, technology and design of solid state devices, rather than their application. Topics will include: introduction to and application of concepts of quantumphysics to solids, effect of periodicity in solids on electron energy states, electron statistics, metals, insulators, semiconductors and superconductors, thermionic and field ass isted electron emission, electron scattering and mobility of charge carriers, intrinsic and extrins ic semiconductors, quantitative treatment of $p-n$ junction, diffusion and recombination of excess carriers,
quantitative treatment of electron injection, majority and minority components of the junction current, breakdown, quantitative treatments of bipolar junction transistor, field effect transistor and tunnel diodes, physics of metalsemiconductor and metal-insulator-semiconductor junctions and devices, superconductivity and superconducting devices, DC and AC Josephson effects, Josephson junctions, superconductive quantum interference devices. This is the first course in a sequence of two: Ph 440 and Ph 441. Expected preparation: Ph 312 or Ph 318.

Also offered for graduate-level credit as Ph 540 and may be taken only once forcredit. .

## Ph 441 -Physics of SolidState Devices (4)

This is a survey intended to provide the foundation necessary for understanding of function, technology and design of solid state devices, rather than their application. Topics will include: introduction to and application of concepts of quantumphysics to solids, effect of periodicity in solids on electron energy states, electron statistics, metals, insulators, semiconductors and superconductors, thermionic and field assistedelectron emis sion, electron scattering and mobility of charge carriers, intrinsic and extrinsic semiconductors, quantitative treatment of $p-n$ junction, diffusion and recombination of excess carriers, quantitative treatment of electron injection, majority and minority components of the junction current, breakdown, quantitative treatments of bipolar junction transistor, field effect transistor and tunnel diodes, physics of metalsemiconductor and metal-insulator-semiconductor junctions and devices, superconductivity and superconducting devices, DC and AC Josephson effects, Josephson junctions, superconductive quantum interference devices. This is the second course in a sequence of two: Ph 440 and Ph 441 . Expected preparation: Ph 312 or Ph 318.
Also offered for graduate-level credit as Ph 541 and may be taken only once for credit. .

## Ph 445 -Microelectronic Device Fabrication I (4)

The first part of the series includes crystal growth, crystal structure, wafer preparation, ion implantation, doping and diffusion, oxidation, defects, heterogeneous chemical reactions, thermodynamics and kinetics of basic processes such as diffusion and oxidation. These concepts are applied bothto IC and photovoltaic devicefabrication. Realistic process flows, physical metrology, device structure, electrical beh avior and their trade-offs are discussed. Extension and limitation of "top-down" processing to fabrication of nanoscale structures such as nano-rods, nano-wires, etc., and application of these to devices are also introduced.
Also offered for graduate-level credit as Ph 545 and may be taken only once for credit. .Prerequisite: Ph 314or consent of instructor.

## Ph 446 - Microelectronic Device Fabrication II (4)

The emphasis of second part of this seroes is on metallization, dielectrics, and multilevel interconnects. Metallization is sues discussed will include silicides, barrier layers, interconnects, multilevel metallization architecture, and low-k dielectrics. This is be followed by discussion of deposition and properties of various dielectric films. Epitaxial growth and properties of SOI and SiGe devices are also covered. In all these discussions, physics related to fabrication of nanoscale devices and special effects that come into play at these dimensions will be examined. Assignments will include computer simulations of device fabrication (i.e., virtual fab software).
Also offered for graduate-level credit as Ph 546 and may be taken only once for credit. . Prerequisite: Ph 445 or Ph 545 or consent of instructor.

## Ph 447 - Microelectronic Device Fabrication III (4)

The third part of this series starts with the techniques required to pattern the nanoscale structures on wafers. These techniques include electron beam, x-ray, EUV, and photolithography, including discussion of resist technology. This is followed by methods to produce these structures using wet and dry methods. Discussion of dry processing includes fundamentals and applications of plas mas for etching and deposition (e.g., high-density plasmas), including plasma damage. The limitations of fabrication and operation of nano-scale devices are discussed. Special project for this class will involve fabrication of a virtual device (bipolar junction transistor) with specified electrical performance parameters using the virtual fab software.

Also offered for graduate-level credit as Ph 547 and may be taken only once for credit. . Prerequisite: Ph 446 or Ph 546 or consent of instructor.

## Ph 451 -Electron Microscopy (4)

Electron optics theory, specimen preparation and experimental work with trans mis sion and scanning electron microscopes, Microchemical analysis with an energy dispersive spectrometer. Specimens from all the sciences. Two lectures, one 3-hour laboratory period. This is the first course in a sequence of two: Ph 451 and Ph 452. Expected preparation: one year of general physics and one yearof any otherscience.
Also offered for graduate-level credit as Ph 551 and may be taken only once for credit. .

## Ph 452 - Electron Microscopy (4)

Electron optics theory, specimen preparation and experimental work with trans mis sion and scanning electron microscopes, Microchemical analysis with an energy dispersive spectrometer. Specimens fromall the sciences. Two lectures, one 3 -hour laboratory period. This is the second course in a sequence of two: Ph 451 and Ph
452. Expected preparation: one year of general physics and one year of any other science.
Also offered for graduate-level credit as Ph 552 and may be taken only once for credit. .

## Ph 464 - Applied Optics (4)

An overview of optics and such principal application as fiberoptics; chemical, biological, and physical sensors; optical information processing, acousto-optics; lasers and detectors. This course is the same as ECE594; coursemay only be taken once for credit. Expected preparation: Ph 203 or Ph 213 or Ph 223, Mth 254.
Also offered for graduate-level credit as Ph 564 and may be taken only once for credit. .

## Ph 471 -Physical and Human Dimensions of Climate Change (4)

A holistic course on global change scienceconnecting atmospheric change, climate theory and the human response to global warming. Lays a foundation for understanding the complexissues of climatic change, its linkages and feedbacks. Policy options to manage the climate are examined using models, their predictions, and uncertainties.

Also offered for graduate-level credit as Ph 571 and may be taken only once forcredit. Prerequisite: $\mathrm{Ph} 211, \mathrm{Ph} 212$, Ph 213, Mth 251, Mth 252, Mth 253. Cross-Listed as: ESM 471.
Ph 472 - Introduction to Nonlinear Dynamics and Chaos (4)

Introduction to basic theoretical and experimental tools to study chaos and nonlinear behavior. Desktop experiments and computer simulations of chaotic systems. Expected preparation: one year of general physics.

Also offered for graduate-level credit as Ph 572 and may be taken only once forcredit.

## Ph 473 - Alternative Energies (4)

Starting with a review of global energy trends, this course will cover the major resources of alternative energies (hydropower, wave, tidal and wind energy, solarenergy, nuclear fis sion and fusion), their characteristics, utilization and technology as well as environmental and public impact. Special attention will be given to photovoltaics and solarcell technology. Market developments will also be analyzed based on simple models.
Also offered for graduate-level credit as Ph 573 and may be taken only once forcredit. .Prerequisite: Ph 213 or Ph 223.

## Ph 475 -Stellar Astronomy Online for Educators (4)

Class will acces s online materials in stellar as tronomy education to help current and prospective science teachers
update their knowledge of recent developments in as tronomy. Expected preparation: oneyear of general physics.
Also offered for graduate-level credit as Ph 575 and may be taken only once for credit. .

## Ph 476 - Obs ervational Astronomy (2)

Emphasis on hands-on activities and the observation of our own night sky. Observation of planets, sun, moon, globular clusters, galaxies, and black holes. Observational techniques including the use of telescopes, binoculars, and photography will be covered. Observational field trip to an observatory at a dark sky site. Expected preparation: one year of general physics.
Also offered for graduate-level credit as Ph 576 and may be taken only once for credit. .

## Ph 477 - Air Pollution (4)

Air pollution meteorology needed to understand air pollution, at mospheric dis persion models, K-theory, box models and receptor models. Useof simple computer models. This course is a foundation for the quantitative understanding of air pollution: At any point in the environment(receptor), how much pollution is caused by a known source? If there are many sources, how much pollution does each source contribute at a receptor? Expected preparation: Ph 213 or Ph 223 , one year of calculus, introductory course in differential equations.
Also offered for graduate-level credit as Ph 577 and may be taken only once for credit. .
Ph 481 - Introduction to Nano(materials)-Scienceand Engineering (4)
An introduction to nano(materials)-science andengineering for students in physics, chemistry, geology, electrical and computer engineering, and mechanical and materials engineering. Nanoscale processes and devices and their applications. Expected preparation: two specific advanced upper division science courses dependent on major, or consent of ins tructor.
Also offered for graduate-level credit as Ph 581 and may be taken only once for credit. .

## Ph 490 - Cellular and Molecular Biophysics (4)

An introduction to the physical ideas and methods in the studies of biological phenomena, org anization, structure, and function at the cellular and molecular level. Atomic and molecular structures, energy and interacting forces relating to cellular and molecular biophysics will be discussed. This is the first course in a sequence of two: Ph 490 and Ph 491 . Expected preparation: Ph 203 , Bi 253, and Ch 223. Calculus, previously or concurrently, is recommended.

Also offered for graduate-level credit as Ph 590 and may be taken only once for credit. .

## Ph 491 - Cellular and Molecular Biophysics (4)

An introduction to the physical ideas and methods in the studies of biological phenomena, organization, structure, and function at thecellular and molecular level. Atomic and molecular structures, energy and interacting forces relating to cellular and molecular biophysics will be discussed. This is the second course in a sequence of two: Ph 490 and Ph 491 . Expected preparation: Ph 203 , Bi 253, and Ch 223. Calculus, previously or concurrently, is recommended.

Also offered for graduate-level credit as Ph 591 and may be taken only once forcredit. .

## Ph 495 -Materials Physics: Structure andPhysical Properties of Ordered and Disordered Condensed Matter (4)

Introduction to materials physics. Generalized geometricstructural crystallography is at the core of this field because it allows for the derivation of the physical properties of condensed matter. Crystallographic symmetries are treated as continuous features. Quantitative X-ray diffraction, crystal defects, textures, modulated structures, and quasicrystals are also discussed.

Also offered for graduate-level credit as Ph 595 and may be taken only onceforcredit. .Prerequisite: Ph 211, Ph 212, Ph 213, Ph 221, Ph 222, Ph 223, Ph 311, Ph 312, Ph 314, Ph 315, Ph 316, Ph 322, Ph 431, Ph 432, Ph 434, and their prerequisites; Mth251, Mth 252, Mth 253: Calculus I-III, Mth 256: Differential equations and multivariate calculus, Mth 261: Linear Algebra and their prerequisites.

## Ph 501 - Research (1-9)

(Credit to be arranged.) Consent of instructor.

## Ph 502 - Independent Study (1-6)

(Credit to be arranged.)

## Ph 503 -Thesis (1-9)

(Credit to be arranged.)

## Ph 504 -Cooperative Education/Internship (1-9)

(Credit to be arranged.)

## Ph 505 - Reading and Conference (1-6)

(Credit to be arranged.) Consent of instructor.

## Ph 506 -Special Projects (1-9)

(Credit to be arranged.) Consent of instructor.

## Ph 507 -Seminar (0-6)

(Credit to be arranged.) Consent of instructor.

## Ph 510 -Selected Topics (1-6)

(Credit to be arranged.) Consent of instructor.

## Ph 511 - Introduction to Quantum Mechanics (4)

An introduction to the formulation and application of wave mechanics; the Schrodingerequation and its application to time-independent problems (both one-and threedimensional problems ); identical particles; approximation methods including mainly time-independent perturbations. Brief exploration of the potential applications of quantum mechanics to engineering: quantumnano-structures and quantumcomputers. This course is the same as ECE 598 and may be taken only once for credit. Expected preparation: Ph 318 or 311, Mth 256.
Also offered for undergraduate-level credit as Ph 411 and may be taken only once for credit. Cross-Listed as: ECE 598.

## Ph 512 - Quantum Mechanics II (4)

Introduction to the three-dimensional Schrodinger equation and applications such as band theory, selection rules, and molecules. The first half of the course will focus on exactly solvable models and analytic solutions. The second half will emphasize approximation methods in quantum mechanics, including perturbation theory, the variational principle, and the WKB approximation. The use of scientific software and modeling to solve quantum mechanical problems will be emphasized. Expected preparation: Ph 434 or Mth 322.
Also offered for undergraduate-level credit as Ph 412 and may be taken only once for credit. Prerequisite: $\mathrm{Ph} 511, \mathrm{Ph}$ 311, and Mth 256.

## Ph 513 - Introduction to SolidState Physics (4)

Experimental and theoretical survey of the lattice and electronic properties of solids with particularemphasis on the properties of electrons in semiconductors and modern materials. Expected preparation: Ph 411 or Ph 312.
Also offered for undergraduate-level credit as Ph 413 and may be taken only once for credit. .

Ph 515 - Experimental Optics (3)
Advanced experiments in physicaloptics. One 4-hour laboratory period.

Also offered for undergraduate-levelcredit as Ph 415 and may be taken only once for credit. .

## Ph 525 - Classical Mechanics II (4)

Advanced formulation of mechanics. Lagrange's and Hamilton's equations. The inertial tensor, free rotations, and rigid body dy namics. Theory of s mall oscillations, coupled oscillations and normal modes.

Also offered for undergraduate-level credit as Ph 425 and may be taken only once for credit. .

## Ph 526 - Thermodynamics and Statistical Mechanics (4)

Concepts of temperature, work, and heat; first and second laws of thermodynamics and applications; thermodynamic potentials; heat engines, Carnot cycle, and ideal gases; entropy and its statistical interpretation; kinetic theory of gases; classical and quantumstatistics; introduction to statistical mechanical ensembles.
Also offered for undergraduate-levelcredit as Ph 426 and may be taken only once for credit. .

## Ph 531 -Electricity and MagnetismI (4)

Advanced study of electricity and magnetismcovering field and potential of charge arrays, electrostatic field energy, images, multipoles, Laplace's equation, Biot-Savart and Ampere's laws, magnetic field energy, vector potential, dis placement current, dielectrics and their microscopic models, electromagnetic wave equations, boundary conditions, energy radiation, magnetic materials and their microscopic models. This is the first course in a sequence of two: Ph 531 and Ph 532.

Also offered for undergraduate-levelcredit as Ph 431 and may be taken only once for credit. .

## Ph 532 -Electricity and MagnetismII (4)

Advanced study of electricity and magnetismcovering field and potential of charge arrays, electrostatic field energy, images, multipoles, Laplace's equation, Biot-Savart and Ampere's laws, magnetic field energy, vector potential, dis placement current, dielectrics and their microscopic models, electromagnetic wave equations, boundary conditions, energy radiation, magnetic materials and their microscopic models. This is the second course in a sequence of two: Ph 531 and Ph 532.
Also offered for undergraduate-level credit as Ph 432 and may be taken only once for credit. .

## Ph 534 -Methods of Mathematical Physics (4)

A survey of methods of applied mathematics used in modern physics, to include: vectors, matrices, operators, and eigenvalues; perturbation theory and series expansion; variation and optimization; numerical methods; transforms; and special functions.

Also offered for undergraduate-level credit as Ph 434 and may be taken only once for credit. .

## Ph 540 - Physics of SolidState Devices (4)

This is a survey intended to providethe foundation neces sary for understanding of function, technology and design of solid state devices, rather than their application. Topics will include: introduction to and application of concepts of quantumphysics to solids, effect of periodicity in solids on electron energy states, electron statistics, metals, insulators, semiconductors and superconductors, thermionic and field as sisted electron emis sion, electron scattering and mobility of charge carriers, intrinsic and extrinsic semiconductors, quantitative treatment of p-n junction, diffusion and recombination of excess carriers, quantitative treatment of electron injection, majority and minority components of the junction current, breakdown, quantitative treatments of bipolar junction transistor, field effect trans istor and tunnel diodes, physics of metalsemiconductor and metal-insulator-semiconductor junctions and devices, superconductivity and superconducting devices, DC and AC Josephson effects, Josephson junctions, superconductive quantum interference devices. This is the first course in a sequence of two: Ph 540 and Ph 541.
Also offered for undergraduate-level credit as Ph 440 and may be taken only once for credit. .

## Ph 541 - Physics of SolidState Devices (4)

This is a survey intended to provide the foundation neces sary for understanding of function, technology and design of solid state devices, rather than their application. Topics will include: introduction to and application of concepts of quantumphysics to solids, effect of periodicity in solids on electron energy states, electron statistics, metals, insulators, semiconductors and superconductors, thermionic and field as sisted electron emis sion, electron scattering and mobility of charge carriers, intrinsic and extrins ic semiconductors, quantitative treatment of p-n junction, diffusion and recombination of excess carriers, quantitative treatment of electron injection, majority and minority components of the junction current, breakdown, quantitative treatments of bipolar junction transistor, field effect trans istor and tunnel diodes, physics of metalsemiconductor and metal-insulator-semiconductor junctions and devices, superconductivity and superconducting devices, DC and AC Josephson effects, Josephson junctions, superconductive quantum. interference devices. This is the second course in a sequence of two: Ph 540 and Ph 541.
Also offered for undergraduate-level credit as Ph 441 and may be taken only once for credit. .

## Ph 545 - Microelectronic Devise Fabrication I (4)

The first part of the series includes crystal growth, crystal structure, wafer preparation, ion implantation, doping and
diffusion, oxidation, defects, heterogeneous chemical reactions, thermodynamics and kinetics of basic processes such as diffusion and oxidation. These concepts are applied bothto IC and photovoltaic devicefabrication. Realistic process flows, physical metrology, device structure, electrical behavior and their trade-offs are discussed. Extension and limitation of "top-down" processing to fabrication of nanoscale structures such as nano-rods, nano-wires, etc., and application of these to devices are also introduced.

Also offered for undergraduate-levelcredit as Ph 445 and may be taken only once for credit. .

## Ph 546 - Microelectronic Device Fabrication II (4)

The emphas is of second part of this seroes is on metallization, dielectrics, and multilevel interconnects. Metallization is sues discussed will include silicides, barrier layers, interconnects, multile vel metallization architecture, and low-k dielectrics. This is be followed by discussion of deposition and properties of various dielectric films. Epitaxial growth and properties of SOI and SiGe devices are also covered. In all these discussions, physics related to fabrication of nanoscale devices and specialeffects that come into play at these dimensions will be examined. Assignments will include computer simulations of device fabrication (i.e., virtual fab software).
Also offered for undergraduate-levelcredit as Ph 446 and may be taken only once for credit. .

## Ph 547 -Microelectronic Device Fabrication III (4)

The third part of this series starts with the techniques required to pattern the nanoscale structures on wafers. These techniques include electron beam, x-ray, EUV, and photolithography, including discussion of resist technology. This is followed by methods to produce these structures using wet and dry methods. Discussion of dry processing includes fundamentals and applications of plasmas foretching and deposition (e.g., high-density plasmas), including plasma damage. The limitations of fabrication and operation of nano-scale devices are discussed. Special project for this class will involve fabrication of a virtual device (bipolar junction transistor) with specified electrical performance parameters using the virtual fab software.

Also offered for undergraduate-level credit as Ph 447 and may be taken only once for credit. . Prerequisite: Ph 446 or Ph 546 or consent of instructor.

## Ph 551 - Electron Microscopy (4)

Electron optics theory, specimen preparation and experimental work with trans mis sion and scanning electron microscopes, Microchemical analysis with an energy dispersive spectrometer. Specimens fromall the sciences. Two lectures, one 3-hour laboratory period. This is the first course in a sequenceof two: Ph 551 and Ph 552.

Also offered for undergraduate-level credit as Ph 451 and may be taken only once for credit. .

## Ph 552 - Eectron Microscopy (4)

Electron optics theory, specimen preparation and experimental work with trans mis sion and scanning electron microscopes, Microchemical analysis with an energy dispersive spectrometer. Specimens fromall the sciences. Two lectures, one 3-hour laboratory period. This is the second coursein a sequence of two: Ph 551 and Ph 552.

Also offered for undergraduate-level credit as Ph 452 and may be taken only once for credit. .

## Ph 564 - Applied Optics (4)

An overview of optics and such principal application as fiberoptics; chemical, biological, and physical sensors; optical information processing, acousto-optics; lasers and detectors.
Also offered for undergraduate-level credit as Ph 464 and may be taken only once for credit. .Cross-Listed as:This course is the same as ECE 594 and may only be taken only once for credit.

## Ph 571 - Physical and Human Dimensions of Climate Change (4)

A holistic course on global change science connecting atmospheric change, climate theory and the human response to global warming. Lays a foundation for understanding the complexis sues of climatic change, its linkages and feedbacks. Policy options to manage the climate are examined using models, their predictions, and uncertainties.

Also offered for undergraduate-level credit as Ph 471 and may be taken only once for credit. Prerequisite: $\mathrm{Ph} 211, \mathrm{Ph}$ 212, Ph 213, Mth 251, Mth 252, Mth 253. Cross-Listed as: ESM 571.

## Ph 572 - Introduction to Nonlinear Dynamics and Chaos (4)

Introduction to basic theoretical and experimental tools to study chaos and nonlinear behavior. Desktopexperiments and computer simulations of chaotic systems. Expected preparation: one year of general physics.
Also offered for undergraduate-level credit as Ph 472 and may be taken only once for credit. .

## Ph 573 - Alternative Energies (4)

Starting with a review of global energy trends, this course will coverthe major resources of alternative energies (hydropower, wave, tidal and wind energy, solarenergy, nuclear fission and fusion), theircharacteristics, utilization and technology as well as environmental and public impact. Special attention will be given to photovoltaics and
solarcell technology. Market developments will als o be analyzed based on simple models.

Also offered for undergraduate-levelcredit as Ph 473 and may be taken only once for credit. .

## Ph 575 -Stellar Astronomy Online for Educators (4)

Class will access online materials in stellar as tronomy education to help current and prospective science teachers update their knowledge of recent developments in astronomy.
Also offered for undergraduate-level credit as Ph 475 and may be taken only once for credit. .

## Ph 576 - Observational Astronomy (2)

Emphasis on hands-on activities and the observation of our own night sky. Observation of planets, sun, moon, globular clusters, galaxies, and black holes. Observational techniques including the use of telescopes, binoculars, and photography will be covered. Observational field trip to an observatory at a dark sky site.
Also offered for undergraduate-level credit as Ph 476 and may be taken only once for credit. .

## Ph 577 - Air Pollution (4)

Air pollution meteorology needed to understand air pollution, atmospheric dispersion models, K-theory, box models and receptor models. Us eof simple computer models. This course is a foundation for the quantitative understanding of air pollution: At any point in the environment (receptor), how much pollution is caused by a known source? If there are many sources, how much pollution does each source contribute at a receptor?
Also offered for undergraduate-levelcredit as Ph 477 and may be taken only once for credit. .

## Ph 581 - Introduction to Nano(materials)-Scienceand Engineering (4)

An introduction to nano(materials)-science and engineering for students in physics, chemistry, geology, electrical and computer engineering, and mechanical and materials engineering. Nanoscale processes and devices and their applications.
Also offered for undergraduate-level credit as Ph 481 and may be taken only once for credit. .

## Ph 582 -Physical Metallurgy (2)

Introduction to principles of physical metallurgy. Includes the atomic and crystalographic structures of metals and alloys; defects in structure and the importance of them in determining the properties of metals; phase diagrams of alloy systems and examples of important sy stems; diffusion and phase transformations, emphasizing the solid state; plasticity and fracture of crystals; and corrosion. Recommended prerequisites: Ph 203, Ch 223.

## Ph 583 - Physical Metallurgy (2)

Introduction to principles of physical metallurgy. Includes the atomic and crystalographic structures of metals and alloys; defects in structure and the importance of themin determining the properties of metals; phase diagrams of alloy systems and examples of important systems; diffusion and phase transformations, emphasizing the solid state; plasticity and fracture of cry stals; and corrosion. Recommended prerequisites: Ph 203, Ch 223.

## Ph 584 - Physical Metallurgy Laboratory (1)

Experimental studies of the structure of metals by light microscope, X-ray diffraction, and microhardness techniques. Heat treatment of metals and studies of the resulting structural changes. Corequisite: concurrent enrollment in $\mathrm{Ph} 481,482,483$.

## Ph 585 - Experimental Methods in Applied Physics (4)

Introduction to modern instrumentation used in applied physics, focusing on nanoscience and materials, atmospheric physics, and biophysics, including theory and practice of the instruments. This is the first course in a sequence of two: Ph 585 and Ph 586.
Prerequisite: admis sion to Ph.D programin Applied Physics, M.S. in Physics, or ESR Ph.D programs.

## Ph 586 - Experimental Methods in Applied Physics (4)

Introduction to modern ins trumentation used in applied physics, focusing on nanoscience and materials, atmospheric physics, and biophysics, including theory and practice of the instruments. This is the second course in a sequence of two: Ph 585 and Ph 586.
Prerequisite: admis sionto Ph.D programin Applied Physics, M.S. in Physics, or ESR Ph.D programs.

## Ph 590 - Cellular and Molecular Biophysics (4)

An introduction to the physical ideas and methods in the studies of biological phenomena, org anization, structure, and function at the cellular and molecular level. Atomic and molecular structures, energy and interacting forces relating to cellular and molecular biophysics will be discussed. This is the first course in a sequence of two: Ph 590 and Ph 591.

Also offered for undergraduate-level credit as Ph 490 and may be taken only once for credit. .

## Ph 591 - Cellular and Molecular Biophysics (4)

An introduction to the physical ideas and methods in the studies of biological phenomena, org anization, structure, and function at the cellular and molecular level. Atomic
and molecular structures, energy and interacting forces relating to cellular and molecularbiophysics will be discussed. This is the second course in a sequence of two: Ph 590 and Ph 591.

Also offered for undergraduate-levelcredit as Ph 491 and may be taken only once for credit. .

## Ph 595 -Materials Physics: Structure andPhysical Properties of Ordered and Disordered Condensed Matter (4)

Introduction to materials physics. Generalized geometricstructural crystallography is at the core of this field because it allows for the derivation of the physical properties of condensed matter. Crystallographic symmetries are treated as continuous features. Quantitative X-ray diffraction, crystal defects, textures, modulated structures, and quasicrystals are also discussed.
Also offered for undergraduate-levelcredit as Ph 495 and may be taken only once for credit. . Prerequisite: Ph 211 , Ph 212, Ph 213, Ph 221, Ph 222, Ph 223, Ph 311, Ph 312, Ph 314, Ph 315, Ph 316, Ph 322, Ph 431, Ph 432, Ph 434, and their prerequisites; Mth 251, Mth 252, Mth 253:
Calculus I-III, Mth 256: Differential equations and multivariate calculus, Mth 261: Linear Algebra and their prerequisites.
Ph 601 - Research (1-12)
(Credit to be arranged.)

## Ph 602 - Independent Study (1-12)

(Credit to be arranged.)

## Ph 603 -Dissertation (1-16)

(Credit to be arranged.)

## Ph 604 -Cooperative Education/Internship (1-9)

(Credit to be arranged.)

## Ph 605 - Reading and Conference (1-9)

(Credit to be arranged.)

## Ph 606 -Special Problems/Projects (1-9)

(Credit to be arranged.)

## Ph 607 -Seminar (0-9)

(Credit to be arranged.)

## Ph 610 -SelectedTopics (1-9)

(Credit to be arranged.)

## Ph 617 - Quantum Mechanics (4)

A detailed discussion of the approximation models for solving the time-independent Schrödingerequation; scattering theory in terms of stationary unbound states; time-dependent theory including the perturbation method; the two-level problemand its application to laser operation. Dirac's formulation using bra and ket; different time-evolution pictures; concept of density matrices; Berry's phase; quantumtheory of angular momentum; Feynman's pathintegral formulation; introduction to relativistic quantummechanics; is sues on the fundamental aspects of quantummechanics including Bell's theorem, the EPR paradox, hidden-variable theory; and Schrödinger's cat problem. This is the first course in a sequence of three: $\mathrm{Ph} 617, \mathrm{Ph} 618$, and Ph 619.

Prerequis ite: $\mathrm{Ph} 411 / 511, \mathrm{Ph} 424$.

## Ph 618 - Quantum Mechanics (4)

A detailed discussion of the approximation models for solving the time-independent Schrödinger equation; scattering theory in terms of stationary unbound states; time-dependent theory including the perturbation method; the two-levelproblemand its application to laser operation. Dirac's formulation using bra and ket; different time-evolution pictures; concept of density matrices; Berry's phase; quantumtheory of angular momentum; Feynman's pathintegral formulation; introduction to relativistic quantummechanics; is sues on the fundamental aspects of quantummechanics including Bell's theorem, the EPR paradox, hidden-variable theory; and
Schrödinger's cat problem. This is the second course in a sequence of three: $\mathrm{Ph} 617, \mathrm{Ph} 618$, and Ph 619.

Prerequisite: $\mathrm{Ph} 411 / 511, \mathrm{Ph} 424$.
Ph 619 - Quantum Mechanics (4)
A detailed discussion of the approximation models for solving the time-independent Schrödingerequation; scattering theory in terms of stationary unbound states; time-dependent theory including the perturbation method; the two-levelproblemand its application to laser operation. Dirac's formulation using bra and ket; different time-evolution pictures; concept of density matrices; Berry's phase; quantumtheory of angular momentum; Feynman's path integral formulation; introduction to relativistic quantummechanics; is sues on the fundamental aspects of quantummechanics including Bell's theorem, the EPR paradox, hidden-variable theory; and
Schrödinger's cat problem. This is the third course in a sequence of three: $\mathrm{Ph} 617, \mathrm{Ph} 618$, and Ph 619.

Prerequisite: $\mathrm{Ph} 411 / 511, \mathrm{Ph} 424$.

## Ph 624 - Classical Mechanics (4)

Advanced treatment of analytical mechanics of particles, systems of particles, and rigid bodies. Methods of Lagrange, Hamilton, and Jacobi. Symmetry and conservation laws. This is the first course in a sequence of two: Ph 624 and Ph 625 . Recommended prerequisite: Ph 425.

## Ph 626 -Hydrodynamics (4)

The theory of fluids and continuous media. Equations of continuity, Euler's equation, flow fields, and applications. Recommended prerequisite: Ph 625.

## Ph 631 -Electromagnetic Fields and Interactions (4)

Classical description of the electromagnetic field: classical electron theory and plasmas. This is the first course in a sequence of three: $\mathrm{Ph} 631, \mathrm{Ph} 632$, and Ph 633 . This course is the same as ECE 635, 636, 637; course may only be taken once for credit.
Prerequisite: Ph 431. Cross-Listed as: ECE 635.

## Ph 632 -Electromagnetic Fields and Interactions (4)

Classical description of the electromagnetic field: classical electron theory and plasmas. This is the second course in a sequence of three: $\mathrm{Ph} 631, \mathrm{Ph} 632$, and Ph 633 . This course is the same as ECE 635, 636, 637; course may only be taken once for credit.
Prerequisite: Ph 431 . Cross-Listed as: ECE 636.
Ph 633 -Electromagnetic Fields and Interactions (4)
Classical description of the electromagnetic field: clas sical electron theory and plasmas. This is the third course in a sequence of three: $\mathrm{Ph} 631, \mathrm{Ph} 632$, and Ph 633 . This course is the same as ECE 635, 636, 637; course may only be taken once for credit.

Prerequisite: Ph 431. Cross-Listed as: ECE 637.

## Ph 664 -Statistical Mechanics (4)

Foundations of statistical mechanics and kinetic theory; statistical interpretation of thermodynamics; ensembles in classical and quantum systems; transport phenomena. This is the first course in a sequence of three: $\mathrm{Ph} 664, \mathrm{Ph} 665$, and Ph 666 . Recommended prerequisite: Ph 619 or 625.

## Ph 665 -Statistical Mechanics (4)

Foundations of statistical mechanics and kinetic theory; statistical interpretation of thermodynamics; ensembles in classical and quantum systems; transport phenomena. This
is the second course in a sequence of three: $\mathrm{Ph} 664, \mathrm{Ph}$ 665, and Ph 666. Expected Preparation: Ph 619 or Ph 625.

## Ph 679 - Advanced Atmospheric Physics (4)

Advanced course to provide a working knowledge of base models for studying global change including the greenhouse effect, global warming, stratospheric ozone depletion fromman-made chemicals, tropospheric chemistry of HO and O 3 and transport modeling. Recommended prerequisites: Ph 578.

PHE - Public Health Education
PHE 199 -Special Studies (1-4)
(Credit to be arranged.)

## PHE 215 - Why Public Health Needs Indigenous Values: Intro to Decolonizing Public Health (4)

As a gateway course of the OHSU-PSU undergraduate Indigenous Health Concentration, this foundational course will engage in concepts of Indigenous values, knowledge and perspectives and launch students into concepts of racial healing and racial justice for health equity. This course will introduce students to a decolonizing framework to advance health equity that centers on the strengths of Indigenous peoples.

PHE 250 - Our Community: Our Health (4)
Examines social, behavioral, and environmental community health-related issues and the controversies that surround them. This course will be a recommended prerequisite for all upper-division classes in the major.

## PHE 252 - First Aid (4)

Emergency care for various types of injuries: assessment, life threatening injuries, medical emergencies, and special situations. Additional training for childbirth and CPR for adult, infant, and child. Course leads to Red Cross certification.

## PHE 270 -Basic Biomechanics (2)

Designed to introduce the anatomical and mechanical principles of kinesiology and biomechanics and their influences upon human movement/physical activity to include; Fundamental principles of the anatomy related to the musculoskeletal systemto include; basic muscular
structure, functional anatomy of joints and basic principles of physics.

## PHE 275 - Stress Management (4)

An overview of the physiology of stress, stress triggers, assessment of stress, and stress management techniques and strategies.

## PHE 295 - Health Promotion/Disease Prevention (4)

Examines scientific literature regarding lifestyle choices that promote optimal health and functioning. Behaviors regarding self-protection, self-care, and health promotion are compared to recommendations emerging fromthis literature.

## PHE 299 -Special Studies (0-4)

(Credit to be arranged.)

## PHE 314 - Research in Health and Fitness (4)

Examines basic aspects of scientific research related to health and fitness. Topics include: reading and critically evaluating scientific research reports; reviewing interpretation of basic statistical analyses; investigating the fundamental skills for developing a research plan, including problemselection, literature review, instrumentation, ethics and sampling.

## PHE 315 - Justice in Public Health: The Epidemic of Missing andMurdered Indigenous Women \& Peoples (4)

Students will investigate the Mis sing Murdered Indigenous Women and People epidemic through a multi-layered decolonizing framework. They will study theory and praxis centered around his torical trauma fromcolonization, the long-termeffects of colonialism, and the social and system-level res ponses that serve to further disempower Indigenous women and girls and perpetuate the ongoing cycle of colonial violence against them. Students will also study critical healing and strengths-based approaches drawn from Indigenous values, experiences, and perspectives to address this critical is sue.

## PHE 320U - Health Ethics: Contemporary Issues (4)

Explores the theoretical, historical, and institutional contexts of health ethics across populations. Students will learn and apply practical skills to deconstruct and analyze ethical challenges across a continuumof health-related
topics fromthe clas sical cases through contemporary debates regarding our global social health, social justice, and related issues. This is the same course as PAH 320U and may be taken only once forcredit.
Cross-Listed as: PAH320U.

## PHE 321U - Introduction to Health Policy (4)

This course presents an overview of health policymaking and describes health policy at the state and federal levels. In addition to the policy process, special emphasis is placed on the role of health services and public health managers and other advocates, and the role they play in crafting policy. The course examines new developments in health policy as they are introduced during the duration of the course and follows themthroughout their journey.

## PHE 322U - Health Services Administration (4)

Understanding the functions of management and adminis tration is essential for anyone assuming adminis trative roles in health services delivery organizations (e.g., hospitals, clinics, and nonprofits). This course introduces the sixclassic management functions, and illus trates health services applications of topics such as strategic planning, risk management, working in/with teams, and changing trends in health care. Students will develop knowledge and the interdisciplinary skills needed to effectively work in adminis tration in various types of health services organizations.

## PHE 323U - Intro to Fat Studies (4)

This course will use a social justice and critical pedagogy approach to examine the impacts of weight bias (sizeis m) on individuals and society. We will center the voices and experiences of those living in larger bodies and use an intersectional lens to analyze how we can effectively impact social determinants of health and well-being. Current innovativechallenges to the weight bias paradigm will be explored along with ways that students can participate in this emerging movement.

## PHE 324 -Health Coaching Foundations (4)

Introduction to health and wellness coaching practice including helping and learning models, behavior change stage theories and evidence-based coaching modalities. Fundamentals of building effectivecoaching relationships including, developing rapport, nonviolent communication, appreciative inquiry, designthinking and generative moments. Students gain practical experience through live demonstrations and partner-coaching.

Prerequisite: PHE 250.

## PHE 325U - Nutrition for Health (4)

Examines basis for and quality of current nutritional requirements, standards, and guidelines. Studies evidence regarding current food fads and controversies. Analyzes personal dietary practices.

## PHE 326U- Drug Education (4)

Examines various approaches to drug education, harm reduction and treatment, while engaging students in furthering their own education on drugs and their impacts on the individual and society. Reviews current and controversial is sues, and innovative solution options.

## PHE 327U- Community Nutrition (4)

This course provides students with an understanding of community nutrition as a career. Course topics include programplanning, policies, resources, and is sues specific to community nutrition.

## PHE 328U-Health and Housing Across the Life Course (4)

Addresses social, cultural, and environmental forces on the relationships between health and housing throughout the life-course. Topics include health disparities in housing quality and type; interventions toimprove housing and neighborhood health; and international models of housing. Public and private strategies to prevent or solve housingrelated health problems will be emphasized.

## PHE 335U - Human Sexuality (4)

A survey of the psychological, phy siological, and behavioral as pects of human sexuality, with particular emphasis on the influenceof popular culture on these dimensions.

## PHE 340 - Motor Learning (4)

Introduction to the principles and practice of motor learning as applied to physical education, physical fitness and sports related activities. Examination of the fundamental process of learning and teaching human movement patterns. the learner, and the process of teaching movement skills.

## PHE 350 - Health and Health Systems (4)

An overview of the organization, financing, and delivery of health services in the United States, with particular
emphasis on analysis fromprofessional, organizational, community, and systems perspectives.

## PHE 351U - Film and Health (4)

Critically explores public health issues as they are portrayed in popular films and discusses the scientific, social, and political underpinnings of the public health is sues portrayed in these movies. Covers diseases such as AIDS, hemorrhagic fever, MS, cancer, leukemia, and multiple chemical sensitivity frombothbiomedical and socialperspectives. Guest speakers from the community will contribute to the discussion.

## PHE 354U - Social Gerontology (4)

Addresses the social andethical is sues, problems, policies, and programs thataffect thequality of life for our rapidly aging population. The interdisciplinary field of gerontology offers students theopportunity to integrate biological, psychological, and social theories of aging. Also examines the economic and political impacts of an aging society.

## PHE 355U - Consumer Health Issues (4)

Identifies and critically analyzes is sues related to the production, marketing, and consumption of health-related goods and services. Media messages about consumer health is sues are examined; topical and timely research is analyzed.

## PHE 361 - Care and Prevention of Injuries (4)

Introduction to the prevention, recognition, care, and rehabilitation of injuries resulting fromparticipation in activity. Practical skills are demonstrated and practiced with emphas is on student participation. Recommended prerequisites: $\mathrm{Bi} 301,302$.

## PHE 363 - Communicable Diseases and Chronic Heal th Problems (4)

Reviews etiology, epidemiology, and approaches to prevention of infectious and chronic diseases. Aspects of risk factors, transmis sion, pathogenesis, immunology, case management, and control programs are discussed. Bas ic human physiological processes are reviewed. Expected preparation: PHE250.

## PHE 365 - Health Promotion Programs for Children and Youth (4)

Provides an understanding of factors thatinfluence health status and development of children and youth in the United States. Particular attention will be directed at health promotion programs for children, youth, and families in school and community settings. Includes a service component.

## PHE 369 - Public Health Law, Policy, and Ethics (4)

This course will introduce the ways in which the public's health is impacted by public policy, law and ethics through the examination of real-world case studies. What health protections are individuals and communities entitled to, who are the players who determine and enforce public health law and policy, and what are the implications of the conflicts of interest that arise?

## PHE 370 - Applied Kinesiology (4)

Overview of anatomical and mechanical bases of human movement. Review of biomechanical principles with applications to exercise and health.

Prerequisite: PHE 270.
PHE 399-Special Studies (1-6)
(Credit to be arranged.)

## PHE 401 - Research (1-8)

(Credit to be arranged.) Consent of instructor.

## PHE 402 - Independent Study (1-8)

(Credit to be arranged.)

## PHE 404-Cooperative Education/Internship (1-15)

(Credit to be arranged.) A work related experience designed to connect and integrate theory with specific activities in a "real" environmentunder supervision. Field hours forstudents taking the internship will be 30 hours percredit per term. Additionally, students will be expected to attend scheduled seminars.

PHE 405 - Reading and Conference (0-6)
(Credit to be arranged.) Consent of instructor.

## PHE 406 -Special Projects (1-6)

(Credit to be arranged.)

PHE 407 -Seminar (1-9)
(Credit to be arranged.) Maximum: 9 credits .

## PHE 408 - Workshop(0-15)

(Credit to be arranged.)

PHE 409 - Practicum(1-12)
(Credit to be arranged.)

## PHE 410 -Selected Topics (1-8)

(Credit to be arranged.)

## PHE 415 -Native American Health: Decolonizing Health Equity (4)

Provides an overview of socio-cultural determinants of health within a Native American context, and culturally responsive and community-centered solutions to achieve health equity with an emphasis on Native American experiences, wisdom, and healing.

Prerequisite: Upper-division standing.

## PHE 416 - Families and Aging (4)

Family ties of middle aged and older adults are explored using a life course perspective. The diversity of family structure and experience is emphasized with attention to gender, race, class, and ethnicity. Life transitions are highlighted as are informal and formal services available to support older adults and their families.
Prerequisite: junior standing.

## PHE 417 - Adapted Physical Education (4)

Designed to give students a background in how to effectively teach physical activity to individuals with disabilities. Additionally, this course is constructed to facilitate the student's understanding of the specific characteristics of exceptional individuals in order to realize their limitations, and especially to maximize their potential.

Prerequisite: Twelve hours of upper-division coursework in PHE.

## PHE 418-Lactation Education 1: Introduction to Human Lactation (4)

The first in the lactation education s eries. Students will develop skills to assess and counsel families experiencing common breastfeeding challenges. Assessment tools and techniques will be introduced. Student will gain strategies for working with diverse adult learners and develop profes sional communication skills for the health care setting. This is the first course in a sequence of three: PHE 418, PHE 419, PHE 420 which must be taken in sequence.
Prerequisite: Instructor approval.

## PHE 419-Lactation Education 2: Advanced Lactation

 Care (4)The second in the lactation education series. Students will develop evaluation and support techniques to address complex maternal and infant breastfeeding challenges. Attention will be given to critically understanding and utilizing evidence-informed information to guide direct lactation support and communication with the health-care team. Students will deepen knowledge of use of referrals and res ources to support the parent-baby dyad. This is the second course in a sequence of three: PHE418, PHE 419, PHE 420 which must be taken in sequence.
Prerequisite: PHE418.

## PHE 420 - Lactation Education 3: Clinical Considerations in Lactation (2)

The third in the lactation education series. This course prepares students for working with complexcases including prematurity, medically fragile infants, and infants or parents with special medical or nutritional needs. Students will strengthen their understanding of the IBLCE Code of Professional Conduct, the IBLCE Scope of Practice, the ILCA Standards of Practice plus additional policies that govern the practice of International Board Certified Lactation Consultants(IBCLCs). Students completing this course as part of the Lactation Education series are prepared for clinical experience and are eligible to apply for the Lactation Practicum. This is the third course in a sequence of three: PHE418, PHE 419, PHE 420 which must be taken in sequence.
Prerequisite: PHE419.

## PHE 421 - Health Coaching Strategies (4)

Concepts and techniques for working with individuals and groups on improving all areas of wellness including fitness, nutrition, weight, stress, and management of life is sues that affecthealth. Best practices for facilitating behavior change, including adminis tering assessments, evaluating readiness for change, motivational interviewing and practice management. Students gain practical experience through live demonstrations and partnercoaching.

Prerequisite: PHE 324.

## PHE 423 - Business and Aging (4)

Economic and business implications of population aging, including an exploration of demographic changes, the economic reality faced by today's older adults in work and retirement, and older adults as consumers.

Prerequisite: Upper-division standing.

## PHE 426 - Advanced Topics in Health Services Administration (4)

This advanced course will build upon knowledge attained in previous courses in the HSMP curriculum. Content addresses advanced discussion of topics regarding systems, policy and organization in health services adminis tration practice. Current is sues/events will be emphasized. The course employs techniques that capitalize on group participation and peer-to-peer learning to stimulate sharing of diverse perspectives and increase the participants' level of engagement with his torically marginalized viewpoints.
Prerequisite: PHE350.

## PHE 427 - Introduction to Health Informatics (4)

An introduction to health informatics, the field devoted to the optimal use of data, information, and knowledge to advance individual health, health care, public health, and health-related research. Students will learn the application of informatics skills and knowledge to health-related problems.
Prerequisite: Upper-division standing.

## PHE 443U - Environmental Health (4)

Designed to enable thes tudent to understand and evaluate complex environmental health is sues induced by waste products generated by modern technology. Specific topics include water quality, air quality, solid and hazardous waste, occupational health, ionizing and nonionizing radiation, chemical contamination of foods, food additives, animal transmission of dis ease, noise, and selected current topics.

## PHE 444U - Global Health (4)

Critically explores global public health is sues as they pertain to different populations throughout the world, such as global disease eradication initiatives, environmental and infectious diseases froman international perspective, and discusses health needs of special populations.

## PHE 445 -Men's Health (4)

The focus of this course is currentmen's health is sues. Students have opportunities to critically explore a broad array of men's health concerns across the life span froma
multidisciplinary perspective. Men's health is sues may include such topics as reproductive health, violence, aging, heart disease, depression, and sexuality. The clas s is taught in an interactive format through group dis cussion, presentations, and the participation of group speakers. The course focuses on the consideration and critique of current influences on men's health including theeffect of the health care system, male s ocialization, the impact of the social and cultural factors, and the influence of evolving technology.

Also offered for graduate-level credit as PHE545 and may be taken only onceforcredit.

## PHE 446U - Health Equity and Social Justice (4)

Provides an overview of the practice of community health promotion. Examines the structure of community health service delivery and the role of advocacy and activismin official/unofficial agencies and policy/decision-making processes.

## PHE 448 - Health Education Techniques and Strategies (4)

Introduces students to basic techniques and strategies used in planning and carrying out healtheducation programs in a variety of settings. Special emphasis is given to scope and sequencing skills, objective writing, selection/development of health education res ources/materials, and methods for and use of technology in the delivery of health education programs. Recommended prerequisite: PHE350.

## PHE 450 - Epidemiology (4)

Introduces principles and methods of epidemiological investigation of infectious/non-infectious dis eases. Illustrates methods by which properly conducted studies of the distribution and dynamic behavior of disease in a population can contribute to understanding of etiologic factors, modes of transmission, and pathogenesis of disease. Recommended prerequisite: PHE 363.

## PHE 451 - Women and Holistic Health (4)

Exploring the intersection of three fields --allopathic medicine, women's health, and complementary therapies-the course examines the emerging field of integrative medicine, highlighting the contributions that women care givers and healers have made to its development. An overview of common women's health concerns provides the opportunity to compare and contrast essential elements of holistic treatment approaches with those of allopathic medicine. Expected preparation: PHE295 or WS 101.

Also offered for graduate-level credit as PHE551 and may be taken only once for credit. .

## PHE 452U - Gender, Race, Class and Health (4)

Emphasizes how the gender-, race-, and class-based organization of society affects the health of our communities. Covers an introduction and historical framework for socialinequities in health; describes disparities in health by gender, race, and class; and explores the interplay between these major social forces and the biological mechanisms that influence the occurrence of disease.

## PHE 453 - Women's Reproductive Health (4)

Critical review of current public health and socio-political is sues in women's reproductive health. Both national and international topics are discussed. Students apply health knowledge in identifying and seeking solutions to the is sues which concernhealth care providers, consumers, and policy makers. Expected preparation: PHE 250 and PHE 335.

Also offered for graduate-level credit as PHE553 and may be taken only once for credit. .

## PHE 454 -Maternal \& Child Health (4)

This course uses a discussion-based format to address maternal and child health as a public health is sue. The course will emphasize the importance of the social, political, and economic contexts for maternal and child health. Ultimately, students in this course will be exposed to the major health issues facing mothers and children today and understand how politics and social norms affect maternal and child health.

Also offered for graduate-level credit as PHE554 and may be taken only once for credit. Prerequis ite: Junior standing.

## PHE 456 - Health Aspects of Aging (4)

Examination of health-related changes that occur with aging. Review of current scientific literature with an investigation of physiological mechanisms responsible for changes in functional capacity throughout life. Explores the role of physical activity and nutrition in healthy aging. Expected preparation: PHE 295 or PHE 250, and Bi 302.

## PHE 466 -Mind/Body Health: Dis ease Prevention (4)

An inves tigation of the integral relationship between body and mind and how that relationship manifests itself in health, illness, and promotes healing. Philosophical and scientific foundations of mind/body health are explored. Mind/body research and its application within allopathic medicine is examined as is research and practice in complementary fields of medicine and health care. Expected preparation: Ps y 204, PHE 363.

Also offered for graduate-level credit as PHE566 and may be taken only once for credit. .

## PHE 467 - Mind/Body Health: Human Potential (4)

Theory and research in the human potential movement is integrated with research in mind/body medicine to produce an expanded understanding of human transformative capacities. Transformative practices including meditation, yoga, imagery, biofeedback, and sport are examined. Elements common to all transformative practices are identified. Expected preparation: PHE466/566.
Also offered for graduate-level credit as PHE567 and may be taken only once forcredit. .

## PHE 471 - Program Planning and Evaluation in Heal th Education: Theory and Skill Development (4)

Examines programplanning models for healtheducation. Includes needs assessment; program goals and objectives; programcontent and methodologies, evaluation, budgeting, and proposal writing. Students will gain practical experience in programplanning and evaluation through community-based learning. Field work required. Recommended prerequis ite: twelve hours of upper-division cours ework in PHE.

## PHE 472 - Marketing Public Health (4)

From behavior change to policy change, how do we make the healthy choice the easy choice? This course will explore the attitudes we bring to our public health work, and tools and strategies we can use to develop our effectiveness in improving health outcomes for individuals and society.
Prerequisite: junior standing.

## PHE 473 - Physiology of Exercise (4)

Examination of physiological responses and adaptations to exercise, with a focus on the interaction of metabolic, endocrine, neuromuscular, circulorespiratory, and environmental factors related to fitness and health.

Also offered for graduate-level credit as PHE 573 and may be taken only once forcredit. . Prerequisite: Bi 301 and Bi 302 or equivalent. Corequisite: PHE 473L.

## PHE 473L - Physiology of Exercise Lab (0)

Physiology exercise lab.

## PHE 474 -Exercise Prescription and Training (4)

Focuses on the basic principles and skills needed for developing and implementing physical fitness programs. Emphas is includes: appropriate/ safe training procedures and the underlying principles which support such methods, applications to younger and older populations, gender
differences, motivational strategies and health behavior theory, and exercise leadership skills. A significant portion of the course involves experiential learning. Recommended prerequisites: PHE 295, 473.

## PHE 475 - Exercise Testing Techniques (4)

Theory and application of as sessmentmethods/tools used to evaluate physiological function relating to fitness and health, including laboratory and field tests. Significant emphas is on developing skills necessary for conducting tests on apparently healthy individuals. Assessment categories include anaerobic performance, muscular strength and endurance, flexibility, body composition, cardiovascularfunction.

Also offered for graduate-level credit as PHE575 and may be taken only once for credit. . Prerequisite: PHE473, or consent of ins tructor. Corequisite: PHE475L.
PHE 475L - Exercise Testing Techniques Lab(0)
Exercise testing techniques lab.

## PHE 478 -ProgramPlanning and Evaluation: Needs Assessment and Interventions (4)

Examines programplanning theories and models for health education. Includes needs assessment; programgoals and objectives; interventions; programcontent and methodologies, measurement, and proposal writing. Students will gain practical experience in program planning through community-based learning. Field work required.This is the first course in a sequenceof two: PHE 478 and PHE 479 and must be taken in sequence.

## PHE 479 - Program Planning and Evaluation in Health Education: Implementation and Evaluation (4)

Examines programplanning theories and models for health education. Includes implementation strategies and evaluation approaches; resource allocation, budgeting, marketing, evaluation design, data analy sis and reporting. Students will gain practical experience in program planning through community-based learning. Field work required. This is the second course in a sequence of two: PHE 478 and PHE 479 and must be taken in sequence.
Prerequisite: PHE478.
PHE 480 - Controversial Issues in Community Health (4)

Examines controversial issues in the field of community health (e.g., violence, women's health, medical technology, access to health services). Group presentations required. Recommended prerequisites: senior status and 12 credits of PHE.

## PHE 501-Research (1-6)

(Credit to be arranged.) Consent of instructor.

## PHE 502 - Independent Study (1-8)

(Credit to be arranged.)

## PHE 503 - Thesis (0-15)

(Credit to be arranged.)

PHE 504 - Cooperative Education/Internship (0-15)
(Credit to be arranged.)

## PHE 505 - Reading and Conference (0-6)

(Credit to be arranged.) Consent of instructor.

## PHE 506-Special Projects (1-6)

(Credit to be arranged.)

## PHE 507 -Seminar (1-9)

(Credit to be arranged.) Maximum: 9 credits.

## PHE 508-Workshop(0-15)

(Credit to be arranged.)

## PHE 509-Practicum(1-9)

(Credit to be arranged.)

## PHE 510 -SelectedTopics (1-8)

(Credit to be arranged.)

## PHE 511 - Foundations of Public Health (3)

Provides students with an understanding of the field of public health. It provides knowledge about public health principles, concepts, values, tools, and applications. Key topics in the clas s include the miss ion of public health, the politics of public health, determinants of health in the United States, major models and strategies for health promotion, and community perspectives on public health interventions.

## PHE 512 -Principles of Health Behavior (3)

Presents the biological, psychological, behavioral, sociocultural, and environmental factors that function in the promotion of health and prevention of disease. Theories developed to explain health and illness behaviors at intrapers onal, interpersonal, and group/community levels are introduced. Ethical is sues involved in healthrelated behaviorchange are examined. Satis fies the core M.P.H. requirement. Expected preparation: graduate standing.

Also offered as PHE612 for doctoral students.
PHE 513 - Introduction to Public Health (3)
This survey course intended to provide graduate students with foundational knowledge of public health and will take a population science approach to public health practice.

## PHE 514 -Physical Activity in Public Health (3)

Overview of topics relevant to the study of physical activity in the United States. Topics: review of physiological alterations related to physical activity; historical background of physical activity recommendations; meas urement issues; community-based approaches to increasing physical activity; school-based physical activity programs; older adults and special populations; work site and health care settings.

## PHE 517 - Community Organizing (3)

Emphasizes the role of community organizing to engage diverse communities to advance the conditions in which people can be healthy. It further examines the role of health educators, grassroots activists, and others in stimulating social, political, and economic approaches to promote community health. Also addresses the advancement of theoretical knowledge and practical skills of community organizing.

## PHE 518 - Topics in Health Studies (3)

In-depth analysis of recent research and related program developments on one or more health-related topics. Topics vary according to termand instructor. Course may be taken more than onceon different topics. Topics may include: mind/body health, nutrition, international health, environmentalhealth, physical activity/exercise, and health of special populations. Recommended prerequisite: graduate standing.

## PHE 519 - Introduction to the Etiology of Disease(3)

The biological and molecular bases of public health: the immune system, genomics, environmental exposures. The evidence-based role of biology in ecological models of population health, its integration in disease prevention and control policies and programs. Effects of behavior on biology. Legal, social, ethical issues will be considered.

## PHE 520-Qualitative Research Design (3)

Presents the philosophical and theoretical bases supporting the development of alternate research paradigms in human inquiry. Es sential characteristics of three major alternate paradigms (interpretivist, constructivist, and critical theory) are introduced. Validity, reliability, and related concepts are examined fromthe pers pective of each paradigm. Alternate strategies for inquiry are presented and ethical considerations related to qualitative forms of inquiry are addressed. Recommended prerequis ite: graduate standing.

## PHE 521 - Quantitative Research Design and Analysis (3)

Introduction to quantitative research design and statistical analys is. Emphasis on development of a research proposal. Topics include descriptive research, experimental and quasi-experimental research, univariate statistical procedures, and methods for planning and writing a research report.

Prerequisite: Bsta 525 and Epi 512.

## PHE 522 - Health and Social Inequalities (3)

Introduction to historical and theoreticalfoundations for social epidemiology; investigates the conceptualization and meas urement of different social determinants of health using a lifecourse approach; explores how the "embodiment" of social forces influence disease processes; and examines different actions (i.e., behavioral, clinical, social, legis lative and political) used to eliminate health inequities within our local, national and international communities.

Also offered as PHE622 and may be taken only once for credit.

PHE 527 - Food Systems and Public Health (3)
Examines public health effects of industrial and alternative food systems. Designed as an introductory coursefor students interested in exploring issues at the intersections of public health, equity, and the environment. Key course themes include: food consumption patterns, health inequities, food insecurity and hunger, healthy food environments, food animal production.

PHE 531 - Women and Exercise: Physiological Aspects (3)

Overview of physiological and health-related effects of exercise on women. Emphasis on the responses and adaptations to exercise specific to women. Topics include gender differences, the mens trual cycle, pregnancy, menopause, and osteoporosis. Recommended prerequisite: PHE 473/573.

## PHE 532 - Developmental Origins of Health and Dis ease (DOHaD) - Epidemiology (3)

Covers the his tory of the Developmental Origins of Health and Disease ( DOHaD ) framework, the trends that drive and result fromDOHaD processes. It will explain epigenetics and other mechanis ms which through priming influence lifelong health.

Also offered as PHE632 to doctoral students.
PHE 534 -Social Epidemiology Methods \& Theory (3)
Surveys socialepidemiology practice including meas urement, study design, analysis and translation for researching behavioral, social, economic, and cultural determinants of population distributions of health outcomes. The courseemphasizes the application of social epidemiology methods tightly coupled to theory salient to community health practice \& policy.
Also offered as PHE634 for doctoral students.
Prerequisite: Epi 512 and Bsta 525.

## PHE 540 -Mass Media and Health (3)

Examine the use andeffectiveness of mass media to both report the news about health and to promote changes of action in health-related areas. Students will be required to critique media health mess ages reg arding their objectivity and the extent to which they are comprehensive.
Prerequisite: PHE512.

## PHE 541 -Media Advocacy and Public Health (3)

Provides students with an understanding of the role of media advocacy in advancing public health policies to promote health. The course uses lectures, group exercises, and case studies to illus trate basic concepts and skills related to media advocacy. Topics covered include: gaining access to the news, framing is sues froma public health perspective, and the use of paid advertising to advance policy. Content areas include tobacco, violence, handguns, suicide, alcohol, and other public health is sues.
Prerequisite: PHE512.
PHE 543 -Drugs, Behavior, and Society (3)
Emphasis will be placed on the relationship between drug and alcohol use and a broad range of social circumstances
as sociated with socio-economic status, race/ethnicity, and gender. Particular attention will be given to policy and service is sues regarding the treatment and prevention of alcohol and drug abuse froma public health perspective. Recommended prerequisite: graduate standing.

## PHE 545 - Men's Health (4)

The focus of this course is current men's health is sues. Students have opportunities to critically explore a broad array of men's health concerns across the life span froma multidisciplinary perspective. Men's health is sues may include such topics as reproductive health, violence, aging, heart disease, depression, and sexuality. The clas s is taught in an interactive format through group dis cussion, presentations, and the participation of group speakers. The course focuses on the consideration and critique of current influences on men's health including theeffect of the health care system, male socialization, the impact of the social and cultural factors, and the influence of evolving technology.
Also offered for undergraduate-level credit as PHE445 and may be taken only once for credit.

## PHE 546 - Urban and Community Health (3)

Examines the social factors as sociated with urban health and quality of life, such as social class, gender inequalities, and racism. Emphasis will be placed upon community development and collective responses to the maintenance of health rather than upon individualized health promotion and disease prevention strategies.

## PHE 550 - Health Promotion ProgramPlanning (4)

Addresses practical applications of health promotion theories. Presents examples of planning, implementation, and evaluation of health promotion programs in a variety of settings as guides for the development of health promotion programs.

## PHE 551 - Women and Holistic Health (4)

Exploring the intersection of three fields --allopathic medicine, women's health, and complementary therapies-the course examines the emerging field of integrative medicine, highlighting the contributions that women care givers and healers have made to its development. An overview of common women's health concerns provides the opportunity to compare and contrast essential elements of holis tic treatment approaches with those of allopathic medicine.

Also offered for undergraduate-level credit as PHE451 and may be taken only once for credit. .

## PHE 552 - Women's Health (3)

Focuses on constructions of gender and sexand their implications for understanding determinants of population health, developing health promotion programs, and creating healthy public policy. Emphasizes the importance of the social, political, and economic context for women's health. Topics include epidemiology of women's health; diversity and health issues; reproductive health and sexuality; health care and access to health services; violence; mental health and emotional well-being; aging; lesbian health; and research in women's health. Course learning will be synthesized through a community-based learning experience involving working with a community org anization to evaluate women's health needs in Portland.

## PHE 553 - Women's Reproductive Health (4)

Critical review of current public health and socio-political is sues in women's reproductive health. Both national and international topics are discussed. Students apply health knowledge in identifying and seeking solutions to the is sues which concern health care providers, consumers, and policy makers.
Also offered for undergraduate-level credit as PHE453 and may be taken only once forcredit. .

## PHE 554 -Maternal \& Child Health (4)

This course uses a dis cussion-based format to address maternal and child health as a public health is sue. The course will emphas ize the importance of the social, political, and economic contexts for maternal and child health. Ultimately, students in this course will be exposed to the major health issues facing mothers and children today and understand how politics and socialnorms affect maternal and child health.
Also offered for undergraduate-level credit as PHE454 and may be taken only once forcredit.

## PHE 561 - Cultural Variations in Aging (3)

The aging population includes an increasing percentageof people froma variety of ethnic groups. Although there may be cultural similarities between these groups and the dominant culture, there are also important differences, particularly in the role of the family in decision-making, attitudes and beliefs about illnes s, dying, and death. Students learn about cultural differences and similarities through observing programs that serve ethnic elders, talking with guest speakers who represent different ethnic communities, and reading several texts related to counseling, healthcare, and understanding grief, death, and dying in a variety of ethnic groups.
Also offered as PHE661 and may be taken only once for credit.

## PHE 562 - Global Aging (3)

The rapid, unprecedented aging of the world's populations is resulting in myriad changes that will affect societies, cultures, economies, families, and individuals and their daily lives. Students will learn about broad global trends related to the aging of the world as well as aging in particular countries and regions.

## PHE 566 -Mind/Body Health: Disease Prevention (4)

An investigation of the integral relationship between body and mind and how that relationship manifests itself in health, illness, and promotes healing. Philosophical and scientific foundations of mind/body health are explored. Mind/body research and its application within allopathic medicine is examined as is research and practice in complementary fields of medicine and health care.
Also offered for undergraduate-level credit as PHE466 and may be taken only once for credit. .

## PHE 567 -Mind/Body Health: Human Potential (4)

Theory and research in the human potential movement is integrated with research in mind/body medicine to produce an expanded understanding of human transformative capacities. Transformative practices including meditation, yoga, imagery, biofeedback, and s port are examined. Elements common to all transformative practices are identified. Expected preparation: PHE466/566.
Also offered for undergraduate-level credit as PHE467 and may be taken only once for credit. .

## PHE 573 - Physiology of Exercise (4)

Examination of physiological responses and adaptations to exercise, with a focus on the interaction of metabolic, endocrine, neuromuscular, circulorespiratory, and environmental factors related to fitness and health.
Also offered for undergraduate-level credit as PHE473 and may be taken only once for credit. . Corequisite: PHE 573L.

PHE 573L - Physiology of Exercise Lab (0)
Physiology exercise lab.

## PHE 575 - Exercise Testing Techniques (4)

Theory and application of as sessment methods/tools used to evaluate physiological function relating to fitness and health, including laboratory and field tests. Significant emphasis on developing skills necessary forconducting tests on apparently healthy individuals. Assessment categories include anaerobic performance, muscular strength and endurance, flexibility, body composition, cardiovascular function.

Also offered for undergraduate-level credit as PHE475 and may be taken only once for credit. . Prerequisite: PHE 473, or consent of instructor. Corequis ite: PHE 575L.

PHE 575L - Exercise Testing Techniques Lab(0)
Exercise testing techniques lab.

## PHE 576 -Physical Activity, Health, and Disease (3)

Review of current research to explore the relationships between physical activity/exercise and health/disease. Primarily investigates the role of physical activity in disease prevention, but als o examines the impact of a variety of physical conditions (e.g., obesity, aging, etc.) on the potential for an active lifestyle. Topics include cardiovascular dis eases, musculoskeletal dis orders, respiratory conditions, metabolic diseases, cancers, and mental health. Recommended prerequisite: PHE473.

## PHE 577 -Exercise, Nutrition, and Performance (3)

Review of metabolic processes and physiological mechanis ms involved in nutrient utilization in humans. Examination of the relationships between nutrition and health, with an emphasis on analysis of current research. Topics include carbohydrates, fats, protein, vitamins/minerals, fluids, weight control, and ergogenic aids. Analysis of nutritional modifications presumably related to exercise, health, and performance. Recommended prerequisites: PHE473.

PHE 601 -Research (1-12)
(Credit to be arranged.)

PHE 602 -Independent Study (1-6)
(Credit to be arranged.)

PHE 603-(1-12)

PHE 605 - Reading and Conference (1-8)
(Credit to be arranged.)

PHE 606 -Special Projects (1-12)
(Credit to be arranged.)

PHE 607 -Seminar (1-9)
(Credit to be arranged.)

## PHE 608-Workshop (1-9)

(Credit to be arranged.)

## PHE 609-Practicum(1-9)

(Credit to be arranged.)

## PHE 610 -Special Topics (1-9)

(Credit to be arranged.)

## PHE 612 - Principles of Health Behavior (3)

Presents the biological, psychological, behavioral, sociocultural, and environmental factors thatfunction in the promotion of health and prevention of disease. Theories developed to explain health and illness behaviors at intrapersonal, interpersonal, and group/community levels are introduced. Ethical is sues involved in healthrelated behaviorchange are examined. Satis fies the core M.P.H. requirement.Expected preparation: graduate standing.
Also offered as PHE512.
PHE 619-Mentored Teaching Experience (4)
Each student will be paired with a Community Health faculty member to shadow one termof teaching of either an UG or an MPH level Community Health class.

## PHE 622 - Health and Social Inequalities (3)

Introduction to historical and theoretical foundations for social epidemiology; investigates the conceptualization and measurement of differentsocial determinants of health using a lifecourse approach; explores how the "embodiment" of social forces influence disease processes; and examines different actions (i.e., behavioral, clinical, social, legis lative and political) used to eliminate health inequities within our local, national and international communities.

Also offered as PHE522 and may be taken only once for credit.

## PHE 623 - Doctoral Seminar in Health Research (1)

Research seminar required for first - and second-year doctoral students in the community health PhD program. Students learn aboutcritical evaluation of health research, hypothesis generation, the publication and review process, grant application process, and development an independent research program.

## PHE 624 -From Philos ophy through Power Calculations: Writing Methods Sections for Research Proposals (3)

Approaches to community health research are explored, including the scientific method, ethics in research, theories, conceptual models and hypothesis generation, causal inference, the elements of research design, meas urement (reliability, validity), developing data collection instruments, internal and external validity, and experimental methods.

## PHE 625 -Advanced Methods Toolkit:Design, Sampling, Scale Development, \& More (3)

A course in applied, non-experimental research designs used in epidemiological research. Emphas is in this course is on quasi-experimental designs, programevaluation, sampling methods, longitudinal designs, and secondary data sources. Students will learn about research design, critical evaluation of research methods, and research proposalconcepts.

## PHE 626 - Teaching and Learning in Health Promotion \& Social Work (3)

This course focuses on pedagogical theory and practice in professional settings. Students develop skills to design, evaluate, and implement effective curriculum and instruction across settings: academic clas srooms, community contexts, and research projects. Topics include educational theory, course design, learning and teaching strategies, as sessment, and scholarship of teaching and learning.
Cross-Listed as: SW 626.

## PHE 632 -Developmental Origins of Health and Disease (DOHaD) - Epidemiology (3)

Covers the history of the Developmental Origins of Health and Disease ( DOHaD ) framework, the trends that drive and result fromDOHaD proces ses. It will explain epigenetics and other mechanis ms which through priming influence lifelong health.
Also offered for graduate-level credit as PHE532.
PHE 634 -Social Epidemiology Methods \& Theory (3)
Surveys socialepidemiology practice including measurement, study design, analysis and translation for researching behavioral, social, economic, and cultural determinants of population distributions of health outcomes. The course emphasizes the application of social epidemiology methods tightly coupled to theory salient to community health practice \& policy.

Also offered for graduate-level credit as PHE534.
Prerequisite: Epi 512 and Bsta 525.

## PHE 661 - Cultural Variations in Aging (3)

The aging population includes an increasing percentage of people froma variety of ethnic groups. Although there may be cultural similarities between these groups and the dominant culture, there are also important differences, particularly in the role of the family in decision-making, attitudes and beliefs about illness, dying, and death. Students learn about cultural differences and similarities through observing programs that serve ethnic elders, talking with guest speakers who represent different ethnic communities, and reading several texts related to counseling, healthcare, and unders tanding grief, death, and dying in a variety of ethnic groups.

Also offered as PHE561 and may be taken only once for credit.
PHE 699 - Special Studies (1-6)
(Credit to be arranged.)

## Phl - Philosophy

Phl 199 - Special Studies (1-6)
(Credit to be arranged.)

## Phl 201 - Introduction to Philos ophy (4)

General introduction to philosophy. While different instructors will use different materials -- typically classical texts -- attention will be given to what makes a question a philosophical question and the nature and methods of philosophicalinquiry.

## Phl 210 - Philos ophy of Religion (4)

Examination of philos ophical questions involved in the study of religion, e.g., the meaning of "God," or "gods;" the traditional arguments for the existence of a god; the meaning of faith and the question of its connection to reason; the problemofevil (of reconciling a god's alleged perfection with the exis tence of evil). Note: this is not a class in comparative religion or the history of religion.

## Phl 212 - Philos ophy in Literature (4)

An introduction to traditional philosophical is sues as they appear in literature, es pecially in fiction. The specific philosophical problems and the literary works willvary from term to term and from instructor to instructor.

## Phl 299 - Special Studies (1-12)

(Credit to be arranged.)

## Phl 300U - Philos ophical Methods and Concepts (4)

A survey of the major strategies of proof and dis proof central to philosophical reasoning, and of the fundamental concepts and distinctions employed in current philos ophical discourse. Aims at providing students who have a serious interest in thinking philosophically with the conceptual tools found to be useful for this purpose. Not recommended as a first course in philosophy.

## Phl 301U - Ancient Philos ophy (4)

Study of Ancient Greek philos ophy with a primary focus on the philosophies of Plato and Aristotle. Key topics include form, matter, substance, and causation.

## Phl 302U - Medieval Philosophy (4)

Study of philosophy during the Medieval period. Topics include developments in logic, role of faith and reason in knowledge, and use of Platonic and Aristotelian philosophy. Course readings include Christian, Jewish, and Islamic authors.

## Phl 303U - Early Modern Philosophy (4)

History of Western philosophy during the Early Modern period (17th and 18th centuries) fromDescartes to Kant. Topics include nature of knowledge and reality; theories of human nature.

## Phl 304U - Nineteenth Century Philos ophy (4)

Study of continental European philosophy fromHegel to Nietzsche. Topics include post-Kantian idealis m, the "social turn" in epis temology, communitarian ethics, reactions to the crisis in Christianity, and the radical critiques of modern social and political institutions.

## Phl 305U - Philos ophy of Medicine (4)

Examination of central philosophical is sues that arise within the theory and practiceof medicine such as: the relationship of medicine to basic sciences, the roles played in medicine by normative concepts such as health and illness, the nature of causal reasoning in medicine, and the nature of diagnostic categories in medicine and psychiatry.

## Phl 306U-Science and Ps eudoscience (4)

An examination of basic is sues in philosophy of science through an analysis of creation science, faith healing, UFO abduction stories, and other pseudosciences. Some of the questions addressed: What distinguishes science from pseudoscience? How are theories tested? When is evidence reliable? Must we invoke the supernatural to explain certain aspects of reality?

## Phl 307U - Science andSociety (4)

Introduction to the philosophy of social science including socialepistemology. Topics include the nature of explanation in social science, the role of normative and hermeneutical principles in it, and the influence of social processes on scientific knowledge.

## Phl 308U- Elementary Ethics (4)

General introduction to ethical theory. Attention will be given to such questions as whether there are objective moral distinctions, what makes right acts right and wrong acts wrong, and how we know (if we do) that actions are right or wrong. Among the theories to be considered are relativism, egoism, utilitarianism, and Kantianism.

## Phl 309U- Business Ethics (4)

Study of the ethical aspects of practices and organizational structuresin the business world such as: the moral status of corporations; the concept of work place rights;
responsibility in advertising; environmental constraints on business; affirmative action in hiring; the social roles of profit and private property; role of work in the life of the individual.

## Phl 310U - Environmental Ethics (4)

Critical study of issues raised by the attempt to formulate an adequateenvironmental ethic. Some of these is sues deal with how our treatment of the environment affects other human beings, i.e., future generations. Others have to do with how non-human beings are to be treated. Do animals have rights? Do species have rights? Do our proper moral concerns extend to such things as trees, rivers, and possibly the planet itself? A number of current problems will be considered, such as population control, limits to growth, global warming, and endangered species.

## Phl 311U- The Morality of Punishment (4)

The focus is on the nature and proper aims of punishment; moral cons iderations that bear on the justice and wisdom of punishment. Consideration will be given to the main
theories of punishment: retributionism, utilitarianism, paternalism, and the view that punishment should be replaced by therapy.

## Phl 312U - Feminist Philos ophy (4)

Critically examines traditional schools of philosophical thinking froma feminist pers pective.

## Phl 313U - Life and Death Issues (4)

Study of moral problems dealing with life and death is sues including abortion, euthanasia, the death penalty, starvation, and nuclear war.

## Phl 314U - Computer Ethics (4)

Examines the moral principles and judgments relevant for computer-related practices. Topics include: ethical as pects of new information technologies; are technologies valueladen; potential abuses and their social consequences; freedom, privacy, and control; security, reliability, and professional responsibilities; risks, control, and regulations; piracy and ownership; ethics of hacking; ethics of virtual environment; and international aspects of new technologies.

## Phl 315-Existentialism(4)

Introduction to a number of philos ophers and literary figures gathered together under the name "existentialism." Authors include Dostoyevsky, Kierkegaard, Nietzsche, Rilke, Kafka, Ortega y Gasset, Jaspers, Heidegger, Sartre and Camus. Topics includeconsciousness, (in)authenticity, alienation, death, anxiety, freedom, time, nihilis m, historical meaning and religion. Recommended: one philosophy course.

## Phl 316U - Social and Political Philosophy (4)

The main philosophical theories of the nature and principles of a just society. Social and political order, freedom, justice, and happiness are declared to be the principalends of any society. Philosophical theories describe, explore, explain, and frequently attempt to justify specific social or political arrangements in order to attain these goals.

## Phl 317U - Philos ophy of Art (4)

Philosophical is sues concerning the creation, interpretation, and consumption of art. Includes an overview of the major philos ophical theories about the
nature of art, an examination of the relationship between art and ethics, art and psychology, art and pornography, and relativism of aes thetic value judgments.

## Phl 318U - Philos ophy of Medicine (4)

Examination of central philosophical is sues that arise within the theory and practiceof medicine such as: the relationship of medicine to basic sciences, the roles played in medicine by normative concepts such as health and illness, the nature of causal reasoning in medicine, and the nature of diagnostic categories in medicine and psychiatry.

## Phl 319U - Introduction to Asian Philosophy (4)

A study of different systems of eastern philosophy through the main classical texts drawn fromHinduism, Buddhism, Taoism, and Confucianism. Topics include: the nature of reality, the self, caus ality, language, knowledge, and ethics.

## Phl 320U- Critical Thinking (4)

Designed to improve reasoning and skills of critical as essment of information. Focuses on practical methods that are applied to case studies frompublic media such as editorials, essays, propag and a advertisements, and newspaper reports of scientific studies.

## Phl 321U- Practical Epistemology (4)

Considers criteria for knowled ge-claims based on different sources, such as: memory, perception, eyewitness testimony, expert testimony, and medical and scientific experts.

## Phl 322U- Minds and Machines (4)

Study of philosophical aspects of artificialintelligence including its functionalist ontology. Topics include the nature of computation, learning, and intelligence and the role of consciousness in thinking and behavior. Expected preparation: 8 credits in any scienceor 8 credits in any philosophy courses.

## Phl 324U - Introduction to Formal Logic I (4)

A course in basic propositional and predicate logic. Topics include translation into formal languages, semantic methods for validity (including truth tables and countermodels), and natural deduction proofs.

## Phl 325U - Introduction to Formal Logic II, Predicate Logic (4)

An extension of the topics in Phl 324 U to include topics such as truth trees, expressive adequacy, and meta-theory (soundness and completeness). Other topics may include modal logic, probabilistic logic, non-classical logics, logic circuits, and computability theory.

## Phl 327 - Introduction to Quantitative Literacy (4)

The goal is to learn to think intelligently and critically about important uses of quantitative data by means of discussion of the following topics: samples, measures, scales, relationships, risks, predictions, graphs, averages, percentages, distributions, randomeffects, and estimates. Intended for students who do not normally take clas ses that involve quantitative matters; its mathematicalcontent is kept at an absolute minimum.

## Phl 330U - Language, Representation, and Reality (4)

An introduction to theories of meaning and their central topics: nature of representation and the referential capacity of language, role of use in meaning, and therole of language in thought and experience.

## Phl 331U - Philos ophy of Education (4)

Exploration of the nature, aims, and value of education by situating it in its historical and contemporary philosophical context and perspectives. Expected preparation: at least one course in philosophy and/or education.

## Phl 332 - Intentionality, Phenomenology, and Existentialism(4)

Examination of the Kantian roots of what becomes known as "intentionality" (i.e., that our conscious acts are directed toward objects, intending them) and subsequent theories of intentionality (e.g., Husserl, Heidegger, Frege, and Searle). Recommended prerequisite: 8 credits in philosophy.

## Phl 333U - Philos ophy of Law (4)

Examines the nature of law, legal obligation and legal interpretation. Is law a part of morality, or nothing more than an expres sion of social power? When are we permitted or required to disobey the law? What is the proper methodology for interpreting laws and deciding cases? Do judges dis cover orcreate law? Readings include classics of jurisprudence (e.g., Austin, Hart, Dworkin) as well as judicial opinions in a selected topic. Recommended prerequisites: Ph1308, 311 or 316.

## Phl 336 - Ancient Political Philos ophy (4)

A study of central philos ophical themes (justice, power, citizenship, etc.) across major figures in ancient Greek and Roman political thought.

## Phl 341 - Latinx Philos ophy (4)

Latinx Philosophy will explore the philosophical contributions of indigenous, His panic, and Latinxthinkers in the Americas and in the Iberian Peninsula, situating philosophical thought in its social and political contexts. Students will grapple with the questions of Latinx identity and philosophy, read philosophical and literary works from pre-Columbian civilizations, scholastic, and Marxian traditions, as well as engage contemporary thinkers on feminism, race, social movements, and migration.
Cross-Listed as: This is the same course as ChLa 341 and may be taken only once for credit.

## Phl 344U- Military Ethics (4)

Examination of the central conceptual, ethical, and existential issues concerning war and the military as an institution and a culture. Topics include theories of war, military values, and theethics of technology (UAVs, WMDs ), insurgency, and terrorism.

## Phl 350U - International Ethics (4)

Introduction to central moral principles relevant for international relations. Topics include military, humanitarian, and covert intervention, economic sanctions, development assistance and human rights.

## Phl 351U- Philosophy of International Human Rights

 (4)Examination of concepts of human rights through classics of political philos ophy, international human rights law and its development, and currenthigh-profile cases of alleged violations of human rights.

## Phl 352U - Philos ophy of International Law (4)

Analysis of International Law through its philosophical foundations, major his torical forms of implementation, and current roles in ameliorating global problems (e.g., war, poverty, and revolutions).

## Phl 355U - Morality and Health Care (4)

Examination of central is sues of the ethics of health care such as euthanasia, abortion and equitable medical allocation.

## Phl 360U - American Philos ophy (4)

Study of American pragmatis mthrough some of its major representatives (e.g., Dewey, Peirce, James, and Mead), its intellectual and cultural context, and its influences on contemporary American philosophers.

## Phl 365U - Atheism (4)

Examination of atheist philosophy including secularismin ethics and politics, naturalismin epistemology and metaphysics, and contemporary naturalistic accounts of religion and faith-based beliefs.

## Phl 367U - Philos ophy of Sport (4)

An examination of the central conceptual, ethical, and existential issues concerning sports. Topics include the nature and role of sports in human flourishing, theories of embodiment, and the morality of sports as an institution and culture including competition and violence.

## Phl 369U- Philos ophy of Sex and Love (4)

An examination of the central philosophical issues emerging from a reflection on sexand love such as: possible essenceofheterosexuality, homosexuality, and as exuality; morality of different expressions of sexand love such as sadomasochismand poly gamy; role of sexuality and romantic love in our self-conception; influence of conceptual sources on our experiences of sexuality and love.

## Phl 370U - Philos ophy of Work and Leisure (4)

Role and nature of work and leisure in theories of the good life and central social and political practices.

## Phl 371U - Philosophy and the City (4)

Explores the role and nature of the city in the history of philosophy and especially social and political theory and the philos ophical bases of contemporary urban theory including political, civic, sustainable, and aesthetic ideas of the city.

## Phl 373 - Queer Philos ophy (4)

The aim of this course is to illuminate the theoretical underpinnings and the radical epistemological, social, and political pos sibilities that are afforded by queer philosophy/theory. Queer Philosophy problematizes and challenges rigid identity categories, norms of sexuality and gender and the oppression and violence that such norms justify. This course will interrog ate the metaphysical, epistemological, phenomenological, social, and political dimensions of queer philosophy.

Cross-Listed as: This is the s ame course as WS 373 and may be taken only once for credit.

## Phl 375U - Food Ethics (4)

An introduction to ethical is sues surrounding food choices including the fairness of food markets, the moral status of animals, and our obligations to the hungry.

## Phl 379U- Feminist Care Ethics (4)

Provides a comprehensive introduction to care ethics from its origins in feminist theory to its present multidisciplinary and international manifestations. The implications of care ethics for ontology, epistemology, aesthetics, identity, performativity and moral theory are addressed. Care ethics is differentiated frommainstreamethical theories. Care theory is applied to a variety of academic and profes sional disciplines including but not limited to business, education, healthcare, literature, political science, performance studies, and ps ychology.
Cross-Listed as: This is the same course as WS 379U and may be taken only once for credit.

## Phl 380 - Philos ophical Writing (4)

Philosophical Writing is a "writing in the genre" course for philosophy majors. It teaches strategies for the major types of philosophical writing, including summaries, blog posts, abstracts, argumentative essays, and research papers. Students may also study es says, dialogues, and short stories to explore the diverse ways in which people have communicated philosophical ideas. This is a writingintensivecourse in which students will receive feedback on multiple drafts to improve their writing.

## Phl 399 - Special Studies (1-6)

(Credit to be arranged.)

## Phl 401 - Research (1-6)

(Credit to be arranged.) Consent of instructor.

## Phl 402 - Independent Study (1-12)

(Credit to be arranged.)

## Phl 403 - Honors Thesis (1-4)

(Credit to be arranged.) Consent of instructor.

## Phl 404 - Cooperative Education/Internship (1-12)

(Credit to be arranged.)

## Phl 405 - Reading and Conference (1-6)

(Credit to be arranged.) Consent of instructor.

## Phl 406 - Projects (1-12)

(Credit to be arranged.)

Phl 407 -Seminar (1-6)
(Credit to be arranged.)

## Phl 409 - Practicum (1-12)

(Credit to be arranged.)

## Phl 410 -Selected Topics (1-6)

(Credit to be arranged.)

## Phl 414 - Plato (4)

Study of selected dialogues of Plato with attention to such topics as his theory of forms, moral philosophy, political philosophy, and to the individual topics of the dialogues, as, for example, knowledge, being, virtue, piety, love, friendship, the state, the nature of philosophy. Expected preparation: 8 credits in philos ophy.

Also offered for graduate-level credit as Ph1514 and may be taken only once for credit. .

## Phl 415 - Aristotle (4)

Study of some of the works of Aristotle, such as his Physics, Metaphysics, Ethics, Politics, parts of the Organon Rhetoric. Among topics for attention are substance, essence, categories, cause, the good man, practical reason. Recommended prerequisite: 8 credits in philosophy.

Also offered for graduate-level credit as Ph1515 and may be taken only once for credit. .

## Phl 416 - The Rationalists: Descartes, Leibniz,Spinoza

 (4)Study, with comparis ons, of selected works of philosophers who maintained that knowledge comes primarily from reason.Likely readings: forDescartes, Meditations, or Rules, or Discourse on Method; for Spinoza, Ethics; forLeibniz, a selection fromamong his many collected works and fragments. Recommended prerequisite: 8 credits in philosophy.
Also offered for graduate-level credit as Ph1516 and may be taken only once for credit. .

## Phl 417 - The Empiricists (4)

Study of the British philosophers, Locke, Berkeley and Hume, who hold that allof the ingredients of thought enter the mind by way of experience and that only what has a definite relation to experience can be thought. Among the particular topics considered will be material substance, spirit, abstract ideas, causation, induction, and skepticism. Recommended prerequis ite: 8 credits in philos ophy.
Also offered for graduate-level credit as Ph 1517 and may be taken only once for credit. .

## Phl 419-Kant (4)

Study of Kant's Philos ophy primarily as represented in the Critiques of Pure Reason, Practical Reason, Judgment. Readings froms ome of these or related works. Possible topics for consideration: necessary connection, the analytic-synthetic distinction, conceptions of science and metaphysics, relation between metaphysics and morality. Recommended prerequisite: 8 credits in philosophy.
Also offered for graduate-level credit as Ph1519 and may be taken only once forcredit. .

## Phl 420 - Wittgenstein (4)

Study of some of the major works of Wittgenstein with emphasis on the later work, especially the Philos ophical Investigations. Attention will be given to Wittgenstein's contributions to philosophical method, as well as to his treatment of iss ues concerning language, meaning, intention, understanding, necessity, and the nature of human pers ons as language users. Recommended prerequisite: 12 credits in philos ophy.
Also offered for graduate-levelcredit as Ph1520 and may be taken only once for credit. .

## Phl 423 - Metaphysics (4)

Philosophical examination of traditional metaphysical is sues (such as relation of body and mind, free will and determinism) and of the more influential ontologies (idealism, materialism, dualism). Introduction also to contemporary controversies over the feasibility of
metaphysics as a rational discipline (logical positivis mand its critics). Recommended prerequisite: 8 credits in philosophy.
Also offered for graduate-level credit as Ph1523 and may be taken only once forcredit. .
Phl 424 - Epistemology (4)
Philosophical examination of some of the main is sues in the theory of knowledge (such as our knowledge of the external world, of the minds of others, of logical and mathematical truths, etc.). Recommended prerequisite: 8 credits in philosophy.
Also offered for graduate-level credit as Ph1524 and may be taken only once for credit. .

## Phl 432 - Philos ophy of Mind (4)

Study of the debates over the nature of mental states and ourknowledge of them. Main topics are dualis mand various forms of physicalism, behaviorism, mind-body identity theories, functionalismand eliminativism. Expected preparation: 8 credits in philosophy.
Also offered for graduate-level credit as Ph1532 and may be taken only once for credit. .

## Phl 433 - Philos ophy of Language (4)

A study of the nature of language, and of problems of meaning, reference, and truth. Recommended prerequis ite: 8 credits in philos ophy.
Also offered for graduate-level credit as Ph1533 and may be taken only once for credit. .

## Phl 445 - Advanced Ethics (4)

A course in moralepistemology or "meta-ethics" dealing with such matters as the distinction and connections between fact and value, " is " and "ought," and description and evaluation. Recommended prerequisite: 8 credits in philosophy.
Also offered for graduate-level credit as Ph1545 and may be taken only once for credit. .

## Phl 446 - Topics in Ethics (4)

Topics in contemporary moral philosophy, including (but not limited to) the relation between applied and theoretical ethics, the foundations of moral responsibility, virtues, and the role of outcomes in moralevaluation. Course may be repeated forcredit to ward major requirements with departmental approval. Expected preparation: Ph1 308 or Phl 445.
Also offered for graduate-level credit as Ph1546 and may be taken only once for credit. .

## Phl 447 - Topics in Social and Political Philosophy (4)

An in-depth study of an important current is sue (such as global justice, multiculturalism, or power) or figure (such as John Rawls, Jürgen Habermas, orMichel Foucault) in social and political philosophy. Course may be repeated for credit if topics are different.
Also offered for graduate-level credit as Ph1547 and may be taken only once forcredit. .Prerequisite: Phl316U or junior-levelstanding orby instructor approval.
Phl 448 - Biomedical Ethics (4)
Advanced study of centralethical is sues in medicine, biomedical research, and health care systems, such as patient autonomy and medical paternalism, justice in provis ion of health services, protection of human subjects in research, and death, dying, andend of life care. Expected preparation: Ph1355.
Also offered for graduate level credit as Phl 548 and may be taken only onceforcredit. Prerequisite: Upper-division standing.

## Phl 449 - Philos ophy of Sustainability (4)

Examination of the core philosophical is sues that arise within the theory and practice of sustain ability and across its three complementary dimensions: environmental, economic, and social.
Also offered for graduate-levle credit as Ph1549 and may be taken only once for credit. .Prerequisite: junior standing.

## Phl 451 - Classical Figures (4)

Intens ive study of some clas sical figures such as Des cartes, Spinoza, Leibniz, Nietzsche, Hegel. Course may be repeated for credit. Recommended: junior level standing.
Also offered for graduate-level credit as Ph1551 and may be taken only once forcredit. .

## Phl 460 - Contemporary European Philosophy (4)

In-depth study of a current theme (such as phenomenology, post-modernis $m$, or post-structuralism) or topical figure (such as Habermas, Derrida, or Benjamin) of European, "Continental" Philosophy.
Also offered for graduate-level credit as Phl 560 and may be taken only once forcredit.. Prerequisite: Junior standing or consent of instructor.
Phl 470 - Philos ophy of Science (4)
History and philosophy of the scientific method. Topics include an overview of the major models of the scientific method (inductivism, falsificationism, Kuhnian paradigms, etc.) and is sues pertaining to the accuracy of these models and their rationality such as theory- ladenness of observation, testing-holism, and the incommensurability of
theory change. Recommended prerequisites: 8 credits in philosophy and upper-division standing.
Also offered for graduate-level credit as Ph1570 and may be taken only once for credit. .

## Phl 471 - Topics in Philosophy of Science (4)

An in-depth analysis of some specific metaphysical issue pertaining to scientific epistemology such as (but not limited to) explanation, causation, realism, geometry, and relativism. Topics vary percourse which will allow students to take course more than once, with departmental approval, to apply toward major requirements. Recommended prerequisites: 8 credits in philosophy and upper-division standing.
Also offered for graduate-level credit as Ph1571 and may be taken only once for credit. .

## Phl 474 -Philos ophy of Logic (4)

Topics: validity, sentence-proposition, connectives, quantifiers, truth, paradoxes, logical necessity and possibility. Optional topics: metalogic, the construction of formal systems of logic and formal proofs of certain of their properties, e.g., consistency and completeness. Recommended prerequisite: Phl 325 .
Also offered for graduate-level credit as Ph1574 and may be taken only once for credit. .
Phl 485-Honors Seminar (4)
Selected topics within areas of the instructor's research. Students will be expected to produce substantial written material on the topic, to be shared and critiqued.
Recommended particularly for students considering graduate work in philosophy. Recommended prerequisites: 20 credits in philosophy with a GPA in philosophy courses of at least 3.5.

## Phl 501 -Research (1-9)

(Credit to be arranged.)

## Phl 504-Cooperative Education/Internship (0-12)

(Credit to be arranged.)

## Phl 505 - Reading and Conference (0-6)

(Credit to be arranged.) Consent of instructor.

## Phl 507 -Seminar (1-6)

(Credit to be arranged.)

## Phl 510 -Selected Topics (1-6)

(Credit to be arranged.)

## Phl 514 - Plato (4)

Study of selected dialogues of Plato with attention to such topics as his theory of forms, moral philosophy, political philosophy, and to the individual topics of the dialogues, as, for example, knowledge, being, virtue, piety, love, friendship, thes tate, the nature of philosophy.
Also offered for undergraduate-levelcredit as Phl 414 and may be taken only once for credit. .

## Phl 515 - Aristotle (4)

Study of some of the works of Aristotle, such as his Physics, Metaphysics, Ethics, Politics, parts of the Organon Rhetoric. A mong topics for attention are substance, essence, categ ories, cause, the good man, practical reason.
Also offered for undergraduate-levelcredit as Ph1415 and may be taken only once for credit. .

## Phl 516 - The Rationalists: Descartes, Leibniz, Spinoza

 (4)Study, with comparis ons, of selected works of philosophers who maintained that knowledge comes primarily from reason. Likely readings: forDescartes, Meditations, or Rules, or Dis course on Method; for Spinoza, Ethics; for Leibniz, a selection fromamong his many collected works and fragments.
Also offered for undergraduate-levelcredit as Phl416 and may be taken only once for credit. .

## Phl 517 - The Empiricists (4)

Study of the British philosophers, Locke, Berkeley and Hume, who hold that all of the ingredients of thought enter the mind by way of experience and that only what has a definite relation to experience can be thought. Among the particular topics considered will be material substance, spirit, abstract ideas, causation, induction, and skepticism.

Also offered for undergraduate-levelcredit as Phl417 and may be taken only once for credit. .

## Phl 519 - Kant (4)

Study of Kant's Philos ophy primarily as represented in the Critiques of Pure Reason, Practical Reason, Judgment. Readings froms ome of these or related works. Possible topics for consideration: necessary connection, the analytic-synthetic distinction, conceptions of science and metaphysics, relation between metaphysics and morality.
Also offered for undergraduate-levelcredit as Ph1419 and may be taken only once for credit. .

## Phl 520 - Wittgenstein (4)

Study of some of the major works of Wittgenstein with emphas is on the later work, especially the Philosophical Inves tigations. Attention will be given to Wittgenstein's contributions to philosophical method, as well as to his treatment of issues concerning language, meaning, intention, understanding, necessity, and the nature of human pers ons as language users.
Also offered for undergraduate-level credit as Phl420 and may be taken only once for credit. .
Phl 523 - Metaphysics (4)
Philosophical examination of traditional metaphysical is sues (such as relation of body and mind, free will and determinism) and of the more influential ontologies (idealism, materialism, dualism). Introduction als o to contemporary controversies over the feasibility of metaphysics as a rational discipline (logical positivismand its critics).

Also offered for undergraduate-level credit as Phl423 and may be taken only once for credit. .
Phl 524 - Epistemology (4)
Philosophical examination of some of the main is sues in the theory of knowledge (such as our knowledgeof the external world, of the minds of others, of logical and mathematical truths, etc.).
Also offered for undergraduate-level credit as Phl424 and may be taken only once forcredit. .

## Phl 532 - Philos ophy of Mind (4)

Study of the debates over the nature of mental states and our knowledge of them. Main topics are dualis mand various forms of physicalism, behaviorism, mind-body identity theories, functionalismand eliminativism.
Also offered for undergraduate-level credit as Ph1432 and may be taken only once for credit. .

## Phl 533 - Philos ophy of Language (4)

A study of the nature of language, and of problems of meaning, reference, and truth.
Also offered for undergraduate-level credit as Phl433 and may be taken only once for credit. .

## Phl 545 - Advanced Ethics (4)

A course in moralepistemology or "meta-ethics" dealing with such matters as the distinction and connections between fact and value, "is " and "ought," and description and evaluation.
Also offered for undergraduate-level credit as Ph1445 and may be taken only once for credit. .

## Phl 546 - Topics in Ethics (4)

Topics in contemporary moral philosophy, including (but not limited to) the relation between applied and theoretical ethics, the foundations of moral res ponsibility, virtues, and the role of outcomes in moral evaluation. Course may be repeated forcredit toward major requirements with departmental approval.

Also offered for undergraduate-levelcredit as Phl446 and may be taken only once for credit. .

## Phl 547 - Topics in Social and Political Philosophy (4)

An in-depth study of an important current is sue (such as global justice, multiculturalis m , or power) or figure (such as John Rawls, Jürgen Habermas, or MichelFoucault) in social and political philosophy. Course may be repeated for credit if topics are different.

Also offered for undergraduate-levelcredit as Ph 1447 and may be taken only once for credit.

## Phl 548 - Biomedical Ethics (4)

Advanced study of central ethical is sues in medicine, biomedical research, and health care systems, such as patient autonomy and medical paternalism, justice in provision of health services, protection of human subjects in research, and death, dying, and end of life care.

Also offered for undergraduate credit as Phl 448 and may be taken only onceforcredit.

## Phl 549 - Philos ophy of Sustainability (4)

Examination of the core philosophical is sues that arise within the theory and practice of sustainability and across its three complementary dimensions: environmental, economic, and social.

Also offered for undergraduate-levle credit as Phl449 and may be taken only once for credit. .

## Phl 551 - Classical Figures (4)

Intensive study of some clas sical figures such as Descartes, Spinoza, Leibniz, Nietzsche, Hegel. Course may be repeated forcredit.
Also offered for undergraduate-levelcredit as Phl451 and may be taken only once for credit. .

## Phl 555 - Morality and Health Care (4)

Examination of issues in health care such as euthanasia, abortion, allocation of transplantable organs, rationing health care, treatment of impaired newborns. Recommended prerequisite: 8 credits in philosophy.

## Phl 560 - Contemporary European Philos ophy (4)

In-depth study of a current theme (such as phenomenology, post-modernis $m$, or post-structuralis $m$ ) or topical figure
(such as Habermas, Derrida, orBenjamin) of European, "Continental" Philosophy.

Also offered for undergraduate-level credit as Ph1460 and may be taken only once for credit. .

## Phl 570 - Philos ophy of Science (4)

History and philosophy of the scientific method. Topics include an overview of the major models of the scientific method (inductivism, fals ificationism, Kuhnian paradigms, etc.) and issues pertaining to the accuracy of these models and their rationality such as theory- ladenness of observation, testing-holism, and the incommens urability of theory change.
Also offered for undergraduate-level credit as Phl470 and may be taken only once for credit. .

## Phl 571 - Topics in Philos ophy of Science (4)

An in-depth analysis of some specific metaphysical issue pertaining to scientific epis temology such as (but not limited to) explanation, causation, realism, geometry, and relativism. Topics vary percourse which will allow students to take course more than once, with departmental approval, to apply toward major requirements.
Also offered for undergraduate-level credit as Ph1471 and may be taken only once for credit. .

## Phl 574 -Philos ophy of Logic (4)

Topics: validity, sentence-proposition, connectives, quantifiers, truth, paradoxes, logical necessity and possibility. Optional topics: metalogic, the construction of formal systems of logic and formal proofs of certain of their properties, e.g., consistency and completeness.
Also offered for undergraduate-level credit as Phl474 and may be taken only once for credit. .

## PHP - Public Health Practice

Courses offered as part of the joint OHSU-PSU School of Public Health.

## PIAA - Pacific Islander and Asian American Studies

## Port - Portuguese

## Port 101 - First-Year Portuguese Term 1 (4)

An introduction to elementary Portuguese. Emphasis on listening comprehension and oral practice, the elements of grammar, vocabulary building, elementary readings. This is the first course in a sequence of three: Port 101, Port 102, and Port 103.

## Port 102 -First-Year Portuguese Term 2 (4)

An introduction toelementary Portuguese. Emphasis on listening comprehension and oral practice, the elements of grammar, vocabulary building, elementary readings. This is the second course in a sequence of three: Port 101, Port 102, and Port 103.

## Port 103 -First-Year Portuguese Term 3 (4)

An introduction to elementary Portuguese. Emphasis on listening comprehension and oral practice, the elements of grammar, vocabulary building, elementary readings. This is the third course in a sequence of three: Port 101, Port 102, and Port 103.

## Port 199 -Special Studies (1-3)

(Credit to be arranged.)

## Port 201 -Second-Year Portuguese Term 1 (4)

Intensive review of basic materials introduced in first-year programand further development of communication skills. This is the first course in a sequence of three: Port 201, Port 202, and Port 203. Expected preparation: Port 103.

## Port 202 -Second-Year Portuguese Term 2 (4)

Intensive review of basic materials introduced in first-year programand further development of communication skills. This is the second course in a sequenceof three: Port 201, Port 202, and Port 203. Expected preparation: Port 103.

## Port 203 -Second-Year Portuguese Term 3 (4)

Intensive review of basic materials introduced in first-year programand further development of communication skills. This is the third course in a sequence of three: Port 201, Port 202, and Port 203. Expected preparation: Port 103.

## Port 299 -Special Studies (1-12)

(Credit to be arranged.)

## Port 301 - Third Year Portuguese (4)

Continued work on the Portuguese language. Port 301 emphasizes listening comprehension and speaking, 302 grammatical patterns, reading, and writing. May be taken concurrently. This is the first course in a sequence of two: Port 301 and Port 302. Expected preparation:Port 203.

## Port 302 - Third Year Portuguese (4)

Continued work on the Portuguese language. Port 301 emphasizes listening comprehension and speaking, 302 grammatical patterns, reading, and writing. May be taken concurrently. This is the second course in a sequence of two: Port 301 and Port 302. Expected preparation: Port 203.

## Port 330 - Brazilian Culture and Civilization (4)

Historical development of life, thought and the arts in Brazil. Conducted in English. This course may be taken twice for credit with different topics.

## Port 399 - Special Studies (1-6)

(Credit to be arranged.)

Port 404 - Cooperative Education/Internship (1-12)
(Credit to be arranged.)

## Port 409 - Practicum(1-8)

(Credit to be arranged.)

## PS - Political Science

## PS 101 - United States Government (4)

An examination is made of American government in theory and practice. Topics include: the constitutional foundations of American government; federalism, civil liberties, and civil rights; Congress and the legis lative process; the presidency and modern bureaucracy; the Supreme Court and judicial policy-making.

## PS 102 - United States Politics (4)

Introduction to is sues and trends in political culture, political behavior, and public policy making. Topics include: public opinion, political parties and pressure groups, elections and voting behavior, political participation, the role of the media, policy making, the budget process, domestic policy, and national security policy.

## PS 103 -State of the World (4)

The course surveys and analyzes the major global is sues of ourtime, including human rights, environmental protection, poverty and underdevelopment, and war and
peace. The importance of using interdisciplinary tools of analys is, and understanding the meaning of a global perspective on world affairs, are emphasized.

## PS 199 -Special Studies (1-4)

(Credit to be arranged.) Consent of instructor.

## PS 200 - Introduction to Politics (4)

Basic introduction to the central themes and fundamental is sues of political life. Examines the nature and meaning of politics and political association in both domestic and international settings. Fundamental concepts and ideas as sociated with government, and politics more generally, are explored, along with the nature of politicalculture and the way this culture is reflected in the institutions and operations of government.

## PS 203 - Introduction to State and Local Politics (4)

Provides an introduction to the role and structure of state and local governments, and examines the forces that influence subnational politics. Topics include federalism, intergovernmental relations, elections, the policy-making process, and the problems confronting states and communities.

## PS 204 - Comparative Politics (4)

A general survey of theories, concepts, and methods employed in comparative politics. Attention given to political behavior, structures, and processes.

## PS 205 - International Politics (4)

An analysis of the nature of relations among nations, with specific reference to contemporary international is sues. Motivating factors will be examined, including nationalis $m$, economic rivalries, and the quest for security. Also treated will be the problemof national sovereignty and its relationship to international cooperation, changing threats to international security in the post-Cold W ar era, and the increasing importance of international economic competition and cooperation.

## PS 208 - Introduction to Political Theory (4)

General introduction to the problems of political theory. A selective survey of the politicalideas of Plato, Machiavelli, Locke, Rousseau, Mill, and Marx which introduced some of the major traditions of politicalthought in the west. The
foundations of the communitarian, republican, and liberal political discourse are examined and discussed.

## PS 221 - Introduction to Law and Legal Studies (4)

Introduction to the nature and function of public law in the United States. The course focuses on fundamental problems of jurisprudence, the relation between law and politics, the nature and function of the court system, judicial process, and the workings of the criminal justice system.

## PS 295 - The Art and Science of Political Science Research (4)

This course is designed to improve students' critical thinking skills and provide tools to craft and critique political science research. Topics covered include the development of research questions, study design, and literature reviews; qualitative and quantitative research methods; and research ethics.

## PS 299 - Special Studies (1-4)

(Credit to be arranged.)

## PS 310 - How to Win a U.S. Political Campaign (4)

Close examination of major aspects of a modern political campaign in the United States. The course takes a pragmatic, skills-based approach aimed at preparing students for high-level, meaningful work on a local, state, or national campaign for both candidates and ballot meas ures. Topics include: campaign org anization and management, fundraising and campaign finance, communications and mes saging, polls and focus groups, campaign strategy and story telling.

## PS 312 -Legislative Process (4)

An examination of the role of legislatures in state politics. Particular attention is given to the forces that shape legislative elections, the relationship between legislatures and governors, and efforts to reformleg is lative politics. Recommended prerequisites:PS 101 and 102.

## PS 313U- The Power Game: A Simulation of Washington Politics (4)

Examines the nature of political power, the complexities involved in policy-making, and therelationship between the major politicalactors in Washington, D.C. The course revolves around a simulation of the U.S. government in
which students play the roles of real members of Congress, the executive branch, interest groups, and the press.

## PS 316U- Politics andthe Arts (4)

Politics permeate the arts, fromgovernment support of arts org anizations to battles over public art. This course examines the government's involvement in the arts. Topics include a his tory, modern challenges to artists and art org anizations, funding, how arts policy is made, copyright protection, artists' rights, censorship, equity, and diversity. Meant for majors and non-majors who are interested in how government actions affect performing and visual artists, filmmakers, and others in the arts community.

## PS 317U - Film and Politics (4)

Examines the politicalmeanings of films. Topics include: how films reflect, and sometimes challenge, basic themes in American politicalculture; how filmmakers capture and encode images in ways that tell a culturally -pleasing story; how audiences make senseof these images and stories to cons truct particular understanding of power, government, and the individual; and the relationship between Hollywood and politics.

## PS 318U-Media, Opinion, and Voting (4)

Course examines the interaction between the mass media, public opinion, and voting behavior in the United States. Competing theories of media effects on public opinion and voting behavior are analyzed, as are competing proposals for reforming electoral campaigns, campaign advertising, presidential debates, and otherfeatures of mass-mediated elections in order to enhance citizen participation. Key questions students will consider include the degree of res ponsibility that politicians, journalists, and citizens should as sume for improving citizen engagement with electoral politics. Recommended prerequisite: PS 102.

## PS 319U- Politics of the Environment (4)

The human relationship with nature is a source of much political conflict and has been since theemergence of the state. This courseexplores the short- and long-termorigins of current conflicts, the emergence of political movements around environmental is sues, alternative world views regarding nature, and the distinctiveness of politics around these is sues. Specific conflicts will be examined, including the relationship between human attempts to control nature and human hierarchies, population, water, and conservation of biodiversity.

## PS 320 - Explore the Law (2)

Interact with practicing lawyers and learn more about the legal profession through a series of workshops. Includes as sis tance with the law school application process such as personal statement preparation and LSAT studying. This course may be repeated forcredit up to two times.

## PS 321 - Introduction to the Supreme Court (4)

An exploration of the U.S. Supreme Court's place in America's constitutional structure, including how the Court forms and shapes policy and how political forces shape Court practices, selection, and decision-making processes.

## PS 325U- Politics and the Legal Enforcement of Morals (4)

Critical examination of law as a mechanismfor the enforcement of moral standards. The limits of law and political authority more generally are explored through an analys is of specific problemareas associated with the legal enforcement of morality. These include, but are not limited to: the use of criminal justice to enforce standards of conventional morality, political tolerance, civil disobedience, and the politics of law and order. Recommended prerequisite: PS 221.

## PS 331 - Oregon Politics (4)

An examination of political structures and policy trends in the stateof Oregon. Attention is given to local governments as well as state government with special emphas is upon the relationships among different governmental entities.

## PS 335U- Race and Politics in the United States (4)

Provides a general survey of constraints and opportunities in American racial minority politics against the backdrop of tremendous demographic change since 1965. Explores a series of debates in American politics with an eye toward the political implications of the changing demographic mix.

## PS 343 - Politics of War (4)

Introduction to the theory and practice of both inter-state war and civil conflict with particular attention to levels of analys is as well as the process and consequences of war.

## PS 345 - U.S. Foreign Policy: The Cold War and Beyond (4)

Analysis of the U.S. foreign policy process, its motives, objectives, and manner of implementation, in the major developments of each adminis tration since 1945. Emphas is is on U.S. relations with the U.S.S.R/Russia and the Third World. Recommended prerequisite: PS 205.

## PS 352U - Introduction to European Politics (4)

An introduction to the political systems and politics of countries in both western and eastern Europe. Includes analys is of institutions, policies, and political behavior, as well as an examination of the roles of culture and history. Both theory and case studies will be presented, and in addition, analysis of European integration.

## PS 353U - Introduction to Latin American Politics (4)

An examination of a number of Latin American countries (Argentina, Chile, Brazil, Mexico, Peru, etc.) in comparative perspective. Topics covered include: the emergence and decline of various regime types within each of these nation-states; the role of the state, various state sectors, state autonomy and state capacity; the emergence of various social classes, class coalition and the impact of both of these on the state; the importance of international factors such as the international economy and the United States.

## PS 354U - Introduction to Asian Politics (4)

Introduction to the policies, institutions, and processes of the politics of Northeast and Southeast A sia.

## PS 355U - Introduction to African Politics (4)

Introduction to the policies, institutions, and processes of the politics of Sub-Saharan Africa.

## PS 361 U- Introduction to the Politics of the Middle East (4)

Introduction to Middle Eastern political systems. Focus will be on the nature of traditional politics, modernization and political development in the region, social stratification, ins stitutions of government, and the political systems of selected Middle East countries. Recommended prerequisite: PS 204 or 205 .

## PS 362U Arab-Israeli Conflict (4)

Examination of the conflicting ideological perspectives, the formation of the state of Is rael, rise of Arab nationalis $m$, emergence of Pales tinian nationalis $m$, the Arab-Is raeli wars, rise of Palestinian activism, diplomatic efforts at partial settlements, and possibilities of a comprehensive settlement. Special attention is given to those elements opposed to a final settlement of the conflict, both within Is rael and among the Palestinian and greater Arab communities. Recommended prerequis ite:PS 204, 205, or 361.

## PS 363 - Politics of Iran (4)

Deepens knowledge of Iran's modern political history and to enriches understanding of Iran's foreign policy. Topic will include: nuclear politics, proxy conflict, political Islam, terroris m , the politics of oil, and regional security and stability in general. The course will focus on Iran's relations with Iraq, Syria, Israel/Palestine, and the Gulf Cooperation Council (GCC) and U.S.-Iran relations.

## PS 371 - War and Morality (4)

Examines the limits observed by states in their resort to war and in the conduct of battle. Surveys the his torical, moral, and legal foundations of these limits, and their enduring relevance in light of changes in international conflict and modern warfare. Topics include aggression and self-defense, preemption, humanitarian intervention, terrorism, torture, and warcrimes.

## PS 373 - Violence, Rebellion, and Civil War (4)

Discusses the causes and consequences of the dominant modes of rebellion and civil war with attention to the role that violenceplays in shaping their character, duration, and outcome. Topics include genocide, famine, civil war, sexual violence in war, nationalis mand ethnic conflict, counterinsurgency and counterterrorism, and peacekeeping.

## PS 380U - Women and Politics (4)

Analysis of the political role of women in politics. Reviews the historical and contemporary analyses of women's participation and status in politics. Recommended prerequisite:PS 101 or 102.

## PS 381U - Women's Leadership (4)

Provides an overview of scholarly theories on why/when/how women lead in politics, business, and law, utilizing a comparative perspective as well as an
intersectionallens. In addition, this course includes a significant skill-building element in which students develop their leadership skills and meet with current women leaders in various fields.

## PS 387 -Politics andFiction (4)

This course explores various themes associated with politics as they are presented in fictional media. The course integrates traditionalacademic material with novels, film, television, poetry, etc., in order to expand student awareness of politics and public life. Recommended prerequisite: PS 200.

## PS 389U- Environmental Political Theory (4)

Examines the conceptual and normative issues surrounding the politics of the environment, including the understanding of environmental problems suggested by various theoretical frameworks, including democratic theory, economic rationalism, sustainability, and green radicalis $m$. Issues dis cussed include theidea of nature in the his tory of political thought, climate change, and animal rights.

## PS 399 - Special Studies (1-6)

(Credit to be arranged.)

## PS 399U- Special Studies (4)

(Credit to be arranged.)

## PS 401 - Research (1-6)

(Credit to be arranged.) Consent of instructor.

## PS 402 - Independent Study (1-12)

(Credit to be arranged.)

## PS 403 - Honors Thesis (1-12)

(Credit to be arranged.) Consent of instructor.

## PS 404 - Cooperative Education/Internship (1-12)

(Credit to be arranged.)

## PS 405 - Reading and Conference (1-6)

(Credit to be arranged.)

## PS 406 -Special Projects (1-12)

(Credit to be arranged.)

## PS 407 - Seminar (1-6)

(Credit to be arranged.) Reading and discussion about an area of political science, with a res earch project required. Enrollment limited.

PS 407H-Seminar (1-6)
Contact the department for a description of this course.

## PS 408 - Workshop(1-4)

(Credit to be arranged.)

## PS 409 - Practicum(1-12)

(Credit to be arranged.) Consent of instructor.

## PS 410 - Selected Topics (1-6)

(Credit to be arranged.) Consent of instructor.

## PS 411 - Advanced Overview of Political Science (4)

An advanced overview of the four established fields of research in political science: American, Comparative, International Relations, and Political Theory, and faculty sub-areas of expertise.
Also offered for graduate-level credit as PS 511 and may be taken only once for credit. Prerequisite: Upper division standing.

## PS 412 - The Presidency (4)

Analysis of the institution, functions, and problems of the presidency. Special attention given to presidential elections, presidential powers, relations with media, presidential leadership. White House staff, executivelegislative relations, and the presidential role in domestic, economic, foreign policy making and execution. Expected preparation: PS 101 and PS 102.

Also offered for graduate-level credit as PS 512 and may be taken only once for credit. .

## PS 413 - Congress (4)

Study of the structure, organization, powers and operations of Congress. Topics covered include: the evolution of Congress, congressional recruitment and elections, legis lative functions, the membership, the leaders, the committee system, the rules and procedures, executivelegis lative relations, pressure groups, lobbying, and reform. Expected preparation: PS 101 and PS 102.
Also offered for graduate-level credit as PS 513 and may be taken only once forcredit. .

## PS 414 -Issues in Public Policy (4)

A study of selected major policies and programs of governmental regulation and service. Emphasis is placed upon the formation, administration, and substantive content of policies in such areas as transportation, public utility regulation, medicalcare, civil rights, education, agriculture, natural res ources, and antitrust laws and the preservation of competition.
Also offered for graduate-level credit as PS 514 and may be taken only once for credit. .

## PS 415 - Comparative Public Policy (4)

Introduction to theories, methods, and cases in comparative public policy. Emphas is on policy learning and applied comparative policy analysis. Unique and shared characteristics of policies in different countries or regions. Topics may include welfare and environmental policy.
Also offered for graduate-level credit as PS 515 and may be taken only once for credit. .Prerequisite: upper-division standing.

## PS 416 -Political Parties and Elections (4)

An examination of political parties and elections in America. Covers such topics as: the changing role of party organizations, machine politics, electoral rules, candidate recruitment, the nomination process, campaign strategies and tactics, campaign finance, and electoral reform. Expected preparation:PS 101 and 102.

Also offered for graduate-level credit as PS 516 and may be taken only once for credit. .

## PS 417 - Interest Groups (4)

This course analyzes the role of interest groups in the political process. Particular attention is given to why some interests are more successful at forming groups and influencing politics than others. The course also examines techniques used to lobby legis latures, the executive branch, and the courts. Expected preparation: PS 101 and PS 102.
Also offered for graduate-level credit as PS 517 and may be taken only once for credit. .

## PS 418 - Contemporary Political Protest in America (4)

Analyzes the role of social movements in recent American history. The course blends theoretical readings with empirical research into specific movements. Movements cons idered include but are not limited to: civil rights, the new left, public interestreform, the freeze movement, the women's movement, the Christian Right, and the paramilitary/skinhead movement.
Also offered for graduate-level credit as PS 518 and may be taken only oncefor credit.

## PS 419 - Political Reform(4)

Examines the concerns that drive the demand for political reform in America, and how specific reform proposals may affect the political system. The first part of the course focuses on a variety of proposals to open up the electoral systemand to improve representation. The second part examines various reforms that are designed to make the government work more effectively andefficiently.
Also offered for graduate-level credit as PS 519 and may be taken only once for credit.

## PS 421 - The Supreme Court and American Politics (4)

Uses selective case law in order to explore the place of the Supreme Court in America's constitutional structure and its interpretation of the relationship between the branches of federal government. Examines the way the Court forms and shapes policy through constitutional interpretation, and the way political forces and influences shape Court practices, judicial selection, and the decision-making process.
Also offered for graduate-level credit as PS 521 and may be taken only oncefor credit.

## PS 422 - Constitutional Law (4)

A study of the way in which the Supreme Court has shaped and influenced governmental structure and political power. Special attention is given to judicial decisions in the areas of federalis m, separation of powers, the commerce clause, and the authority of the presidency. Expected preparation: PS 221.
Also offered for graduate-level credit as PS 522 and may be taken only once for credit. .

## PS 423 - Civil Liberties (4)

A study of Supreme Court decisions that affect individual rights and liberties. Areas of concentration include, butare not limited to, freedom of speech and press, religious liberty, criminal justice, racial justice, gender justice, and the right to privacy. Expected preparation: PS 221.
Also offered for graduate-level credit as PS 523 and may be taken only once for credit. .

## PS 424 -Law, Politics, andSociety (4)

Examines connection between law and the society which creates andenforces it. Law will be studied frombottom up rather than top down. Emphas is placed on what law is, how people use law, including whether access to law is equal, and how the state exercises power through law. Expected preparation:PS 221.

Also offered for graduate-level credit as PS 524 and may be taken only once forcredit. .

## PS 425 - Women and the Law (4)

Examines the relationship between women and the law. The first half of the course considers several theories of women's equality. During the second half of the course students will apply these theories to a variety of problems in gender justice. Substantive issues covered may include: sexual harassment, abortion, fetal protection policies, and pornography. This course is the same as WS 424 and may be taken only once for credit.

Also offered for graduate-level credit as PS 525 and may be taken only oncefor credit. Cros s-Listed as: WS 424.

## PS 427 - The Politics of Public Opinion (4)

Course provides students with solid foundations for understanding the nature and evaluating the role of public opinion in American democracy. It will also teach students how to interpret public opinion polls intelligently. Specific topics covered will include how "public opinion" has been defined historically and in contemporary discourse; the various influences that shape peoples' values, beliefs, and attitudes about politics; the methods that pollsters and survey researchers use to meas ure public opinion and problems with those methods; and the content of Americans' views on controversial political is sues. Expected preparation:PS 318.
Also offered for graduate-level credit as PS 527 and may be taken only once forcredit. .

## PS 429 - American Immigration Politics \& Policy (4)

Exploration of American immigration politics over time and into the current era. Expected preparation: PS 101 or PS 102.

Also offered for graduate-level credit as PS 529 and may be taken only once forcredit. Prerequisite: Upper-division standing.

## PS 431 -State and Local Politics (4)

Intensive examination of the role of the states and cities in the federal system. The course pays particular attention to the importance of political culture in shaping state politics and power relationships between the different levels and branches of government. Oregon's political experiences are used as example and for comparis on. Expected preparation: PS 203.

Also offered for graduate-level credit as PS 531 and may be taken only once for credit. .

## PS 432 - Great Tribal Leaders (4)

Course is based on videotaped interviews with contemporary American Indian leaders discussing the pers onal and social forces that shaped themand the roles they played in shaping federal Indian policy, law, and natural resource management. Key areas of study include historic eras of federal Indian policy; the exercise of power by federal legis lative, judicial, and executive branches and their affects on tribal lives and societies; the continuing survival of tribes; and the evolution of tribal governments to meet unforeseen and overwhelming challenges. Recommended prerequisite: PS 101.

## PS 435 - Disasters and Public Policy (4)

The political, administrative, and public policy is sues surrounding major and catastrophic risks and dis asters including both natural (earthquakes, pandemics, asteroids) and man-made (climate change, nuclear weapons, bioterrorism) events. Expected preparation: PS 101, PS 102, or PS 200.

Also offered for graduate-level credit as PS 535 and may be taken only once for credit. .

## PS 442 - Contemporary Theories of World Politics (4)

Surveys concepts and arguments fromvarious theoretical traditions in international relations. Topics are drawn from the ongoing debate between the realist and liberal schools of thought, as well as the challenges posed by radical, normative, and critical internationalrelations theory. Theories will be examined mainly for their insights on is sues of war and peace. Expected preparation: PS 441.

Also offered for graduate-level credit as PS 542 and may be taken only once for credit. .

## PS 444 - National Security Strategy: Regional Perspectives (4)

Focuses on the regional contexts that influence U.S. national security strategy and the multifaceted reasons security polices succeed or fail in each region of the world. Critical analys is applied to major social, cultural, political, economic, military, technological, and his torical is sues that shape formation of regional security strategy, and to strategic as sessments of U.S. security policies as perceived from other regions' perspectives. Expected preparation: PS 205.

Also offered for graduate-level credit as PS 544 and may be taken only once for credit. .

## PS 446 - National and International Security Policies (4)

A comparis on of national and international security systems, strategies, and policies. Emphas is will be on the current is sues arising in these security systems and on the problems that arise when their needs conflict. Particular emphasis will be placed on contending theories of national and international security. Expected preparation: PS 205 or PS 441.
Also offered for graduate-level credit as PS 546 and may be taken only once for credit. .

## PS 447 - International Organization (4)

The nature and extent of the organization of interaction among nations. Focus on the United Nations, but illustrations and generalization froma wide range of regional and functional organizations including the specialized agencies. Emphasis on the processes of communication, interaction, and negotiation within the organizational environment.

Also offered for graduate-level credit as PS 547 and may be taken only once forcredit.

## PS 448 - International Law (4)

Introduction to public international law. Particular emphasis is placed on the interplay of politics and law in the international system. Types of law, sources of law, law creating agencies, law applying agencies are considered. Contemporary substantive is sues in international law will be discussed. Expected preparation: PS 205 or PS 441.
Also offered for graduate-level credit as PS 548 and may be taken only once for credit. .

## PS 449 - International Environmental Politics andLaw (4)

Explores various environmental problems and is sue areas that exist between and among nation-states. There will be an exploration of the political difficulties that impede solutions and the various pathways that may lead to environmental cooperation. There will also be a focus on the international legal regimes and international institutions designed to regulate environ mental problems.
Also offered for graduate-level credit as PS 549 and may be taken only once forcredit.

## PS 452 - The European Union (4)

Focuses on how the EU has evolved since its beginnings in the 1950s, on its present-day organization and functions, and on how the member countries interact with one another in making EU policies for jointly regulating their internal economies and societies as well as theirexternal policies, i.e., how the EU members also try to manage their relations with the rest of the world. This is the same course as Intl 452 and may be taken only once for credit.

Also offered for graduate-level credit as PS 552 and may be taken only once for credit. Cross-Listed as: Intl452.

## PS 454 - International Political Economy (4)

A study of the contending theories of international political economy: power and interdependence, Regime Theory, dependency, integration, and functionalism, as well as the ideologies of political economy -the liberal, national, and Marxist perspectives. Also considered are the politics of trade, aid, and investment. Expected preparation: PS 205 or PS 441.
Also offered for graduate-level credit as PS 554 and may be taken only once for credit. .

## PS 455 - Politics of Economic Reform in Emerging Market Countries (4)

Explores the process of economic reformin a comparative and international setting by focusing onemerging market countries (e.g., Argentina, Brazil, Mexico, Indonesia, Poland, Turkey, and Thailand). Designed to give a more in-depth analysis of reformpolicies forthe students. Expected preparation: PS 454/554.
Also offered for graduate-level credit as PS 555 and may be taken only once for credit. .

## PS 460 - Political Development in Modern Turkey (4)

Designed to providestudents with an in-depth study of political development literature with a focus on modern Turkey. Examines how modern Turkish republic emerged from the as hes of the Ottoman Empire and evaluate stages of political development during the first, second, and third republic. Finally, assesses the implications of Turkey's new geopolitics (since theend of the Cold War) on Turkish political and economic development in a global perspective.
Also offered for graduate-level credit as PS 560 and may be taken only once for credit. Cross-Listed as: This course is the same as Int1460 and may only be taken once for credit.

## PS 461 - Politics of Economic Reform in Modern Turkey (4)

This course is designed to provides tudents with an in depth study of political development literature with a focus on modern Turkey. We will examine how modern Turkish republic emerged fromthe ashes of the Ottoman Empire and evaluate stages of economic development during the first, second, and third republic. Finally, we will assess the implications of Turkey's new geopolitics (since the end of the Cold W ar) on Turkish economic development in a global perspective. This is the same course as Int1461 and may be taken only once for credit.
Also offered for graduate-level credit as PS 561 and may be taken only once for credit. Cross-Listed as:Int1461.

## PS 462 - International Relations of the Middle East (4)

Examination of the externaldimension of Middle East politics; the role of the great powers; brief analy sis of the British and French roles since 1945; extended analysis of American and Soviet/Russian policy in the Middle East. Special attention will be given to new patterns of international relations in the Middle East in the post-Cold W ar, post-Gulf W arera. Expected preparation: PS 361.
Also offered for graduate-level credit as PS 562 and may be taken only once forcredit. .

## PS 465 -Politics of Russia (4)

An in-depth exploration of Russian politics, history, and culture. Begins with a focus on history, and thus considers the beginnings of the Russian Empire across the centuries. Then examines the rise and fall of communis $m$, with a particular focus on Lenin and Stalin. The final segment of the course focuses on modern Russian politics, with a particular emphasis on the strategies and success of Vladimir Putin.

Also offered for graduate-level credit as PS 565 and may be taken only oncefor credit. Prerequisite: Upper-Division Standing.

## PS 466 -Politics of China (4)

A survey of the historical, institutional, and social roots of contemporary politics in China as well as a consideration of several public policy areas.

Also offered for graduate-level credit as PS 566 and may be taken only once for credit.

## PS 468 - International Politics of East Asia (4)

Examination of the foreign policy motives, objectives, and systems of the major East Asian states: China, Japan, and Korea. Attention is paid in particular to the political economy of regional and extra-regional relationships.
Also offered for graduate-level credit as PS 568 and may be taken only onceforcredit.

## PS 470 - Theories of Comparative Politics (4)

Examines the evolution of the theories and methods of comparative politics, addressing both the recent history of the discipline and the current stateof its practices. Topics include: the behavioral revolution, political development, the role of state, the new institutionalism, and the state-insociety approaches. Expected preparation:PS 204.
Also offered for graduate-level credit as PS 570 and may be taken only once for credit. .

## PS 471 - Gender \& Politics: A Comparative Perspective

 (4)Examination of the role, progress, behavior, and power of women in politics using a comparative lens. Topics include the representation of women in government, the
problems confronting female candidates, the behavior of women officeholders, and the gender gapin politics. Examines women in western democracies, as well as in communist states and developing nations. Individual countries are used as case studies. Expected preparation: PS 200 and junior standing.

Also offered for graduate-level credit as PS 571 and may be taken only once for credit. .

## PS 472 - Democratization and Authoritarianismin the Middle East and North Africa (4)

Introduction to theoretical, empirical, and methodological debates in the comparative and international relations of the Middle East. Examination of contemporary political, economic, and social topics, including institutions and regimes, political economy, women and politics, Is raeliPalestinian conflict, and regional and international affairs.
Also offered for graduate-level credit as PS 572 and may be taken only once for credit. . Prerequisite: Upperdivision standing.

## PS 473 - Government and Politics of Arab North Africa (4)

Examines the domestic and international politics of Arab North Africa, including Morocco, the Moroccan/Western Sahara, Mauritania, Algeria, Tunisia, Libya, and Egypt. Topics include the history of the region, political regimes and authoritarianism, the Arab spring, women's rights, and U.S.-Maghrebi relations.

Also offered for graduate-level credit as PS 573 and may be taken only once for credit. . Prerequisite: upper-division standing.

## PS 474 - Democracy and Development in Latin America (4)

Examines issues of democracy and development in Latin America. It addresses such topics as the role of history, politicalculture, political leadership, political institutions, the state, the military, civil society, social clas ses, level of socio-economic development, and their relationship to the possibilities of success or failure for democracy in Latin America. The course examines specific cases such as Argentina, Brazil, Mexico, Chile, Peru, Venezuela, and Uruguay. Expected preparation: PS 353.

Also offered for graduate-level credit as PS 574 and may be taken only once for credit. .

## PS 475 - Comparative Political Parties andElections (4)

Parties and elections are crucial elements of governance in countries around the world. But while these institutions are omnipresent, there are differences in the power and behavior of political parties as well as in the function and outcome of legislative electoral systems. In this course, we examine those differences with a focus on representation, party survival, and electoral behavior, and performin-
depth case studies of elections in such countries as Germany, Russia, Japan, and Brazil.

Also offered for graduate-level credit as PS 575 and may be taken only once forcredit. Prerequisite: Upper-division standing.

## PS 476 - Politics of Inequality in the United States (4)

Examines three themes: 1) How and why did economic inequality explode in the U.S. in recent decades? This level of inequality is not inevitable. We look to American politics for answers. 2) How does economic inequality intersect with other forms of inequality (e.g., gender, race, and place)? and 3) What is to be done? Students will draw from their pers onal experiences with inequality via exercises and assignments.

Also offered for graduate-level credit as PS 576 and may be taken only once forcredit. Prerequisite: Upper-division standing.

## PS 477 - Global Food Politics and Policy (4)

Politics and policy of food production and consumption in both rich and poor nations. Review of competing policy arguments across is sues relating to food security, markets and market access, and the environment and public health.

Also offered for graduate-level credit as PS 577 and may be taken only once forcredit. Prerequisite: Upper-division standing or graduate standing.

## PS 478 - Comparative Democratic Institutions (4)

Examines differences in how democratic governments are structured across the globe and what these differences mean for governing. Explores differences both among and between presidential, parliamentary, and semi-presidential political systems. Examines federal and unitary political structures, and the role of supreme courts. Field trip to observe alternative democratic system.
Also offered for graduate-level credit as PS 578 and may be taken only once for credit. . Prerequisite: Upperdivision standing.

## PS 479 - Transitions to Democracy (4)

Comparative analysis of political systems which have experienced a transition froman authoritarian to a democratic regime. Attention is given to the conditions supportive of democratic transition and to the problems of maintaining democratic stability. Expected preparation:PS 204.

Also offered for graduate-level credit as PS 579 and may be taken only once for credit. .
PS 481 -Democratic Theory (4)
Critical examination of the principles of democratic politics, including importants tatements in the history of political thought and contemporary political theory. Is sues
discussed include participation, deliberation, electoral competition, constitutionalism, and the challenges of democratic legitimacy in the context of US institutions and increasing globalization.
Also offered for graduate-level credit as PS 581 and may be taken only once for credit. . Prerequisite: sophomore standing orhigher.

## PS 482 - Liberalism and Its Critics (4)

Critical examination of the theory and practice of liberalis $m$ as an ongoing tradition. The basic elements of liberalis $m$ are identified and discussed and criticis ms of the liberal tradition, as offered by communitarians, classical republicans, feminists, and postmodernists, are examined. Liberal responses to these criticis ms are also explored. Expected preparation: PS 381.

Also offered for graduate-level credit as PS 582 and may be taken only once for credit. .

## PS 483 - Justice in the Modern World (4)

Critical analys is of the nature and meaning of social justice. Special attention is given to liberal theories of justice, questions of distributive justice, justice and the rule of law, inter-generational justice, and political alternatives to the liberal vision of social justice. Expected preparation: PS 381.

Also offered for graduate-level credit as PS 583 and may be taken only once for credit. .

## PS 484-Conservatism (4)

Studies classical and contemporary works of conservative political thought, with a focus on how these theories have been applied to political practice.
Also offered for graduate-level credit as PS 584 and may be taken only once for credit. Prerequis ite: Upper-division standing.

## PS 486 - American Political Thought: 1600 to 1820 (4)

The development from 1600 to 1820 of American political thought about government and its proper relation to the individual and society. Specific topics considered include the English background; the colonial mind; ideas informing the revolution; the creation of the Constitution; and the ratification debates; the Jeffersonian and Hamiltonian conflict; John Marshall and the expansion of national power. Attention given to bringing to the surface the fundamental, often inarticulate, patterns, and presuppositions of American thought about political things.
Also offered for graduate-level credit as PS 586 and may be taken only oncefor credit.

## PS 487 -American Political Culture: 1820 to the Present (4)

The development from 1820 to the present of American political thought about government and its proper relation to life, liberty, property and the pursuit of happiness. Topics considered include democratization and the Jacksonian period, slavery, and the nature of the Union, Social Darwinism and industrialization, the progressive period, the coming of the welfare state, and contemporary concerns. Attention given to bringing to the surface the fundamental, often inarticulate, patterns, and presuppositions of American thought about politicalthings.
Also offered for graduate-level credit as PS 587 and may be taken only onceforcredit.

## PS 491 - Testing Theories in Political Science (4)

Survey of the most common methods used to evaluate empirical questions in political science research and as sess the adequacy of theories. The course prepares students to interpret, critique, design, and conduct social scientific analysis. It examines both qualitative andquantitative methodologies, including case study, content analy sis, interviewing, surveys, particip ant observation, field experiments, and statistical analysis.

Also offered for graduate-level credit as PS 591 and may be taken only once forcredit. Prerequisite: Upper division standing or permiss ion of instructor.

## PS 493 - Philosophy of the Social Sciences (4)

An analysis of the practical challenges and competing approaches to the practice of social science, especially political science. Subjects considered include the aims of social science, concepts and description, causality, rationality, macro and micro explanations, interpretation, and postmodernism.
Also offered for graduate-level credit as PS 593 and may be taken only onceforcredit.

## PS 495 - Topics in Specialized Research Methods for Political Science (4)

An examination of a specialized methodological approach and/or technique for interpreting and conducting empirical political science res earch. Each quarter will offer in-depth coverage of a single topic; topics will vary fromquarter to quarter dependent on student interests and instructor specialty. Sample topics include: network analysis, survey research, qualitative methods, formal modeling, maximum likelihood estimation, or us age of specific statistical software applications. Expected preparation: Mth 243, Mth 244, and/or PS 491. This course may be repeated for credit with different topics.
Also offered for graduate-level credit as PS 595.
Prerequisite: Upper-division standing.

## PS 501-Research (1-9)

(Credit to be arranged.) Consent of instructor.

PS 502-(1-9)

## PS 503 - Thesis (1-9)

(Credit to be arranged.) Pass/no pass option.

## PS 504 - Cooperative Education/Internship (1-9)

(Credit to be arranged.)

## PS 505 - Reading and Conference (1-12)

(Credit to be arranged.)

## PS 506 -Special Problems (1-12)

(Credit to be arranged.)

## PS 507 - Seminar (1-6)

(Credit to be arranged.) Reading and discussion about an area of political science, with a research projectrequired. Enrollment limited.

## PS 509 - Practicum(1-9)

(Credit to be arranged.) Consent of instructor.

## PS 510 - Selected Topics (1-6)

(Credit to be arranged.) Consent of instructor.

## PS 511 - Advanced Overview of Political Science (4)

An advanced overview of the four es tablished fields of research in political science: American, Comparative, International Relations, and Political Theory, and faculty sub-areas of expertise.
Also offered for undergraduate-level credit as PS 411 and may be taken only once for credit.

## PS 512 - The Presidency (4)

Analysis of the institution, functions, and problems of the presidency. Special attention given to presidential elections, presidential powers, relations with media, presidential leadership. White House staff, executive-
legis lative relations, and the presidential role in domestic, economic, foreign policy making and execution.
Also offered for undergraduate-levelcredit as PS 412 and may be taken only once for credit. .

## PS 513 -Congress (4)

Study of the structure, organization, powers and operations of Congress. Topics covered include: the evolution of Congress, congressional recruitment and elections, legis lative functions, the membership, the leaders, the committee system, the rules and procedures, executivelegis lative relations, pressure groups, lobbying, and reform.
Also offered for undergraduate-levelcredit as PS 413 and may be taken only once for credit. .

## PS 514 -Issues in Public Policy (4)

A study of selected major policies and programs of governmental regulation and service. Emphas is is placed upon the formation, adminis tration, and substantive content of policies in such areas as transportation, public utility regulation, medicalcare, civil rights, education, agriculture, natural resources, and antitrust laws and the preservation of competition.
Also offered for undergraduate-levelcredit as PS 414 and may be taken only once for credit.

## PS 515 - Comparative Public Policy (4)

Introduction to theories, methods, and cases in comparative public policy. Emphas is on policy learning and applied comparative policy analysis. Unique and shared characteristics of policies in different countries or regions. Topics may include welfare andenvironmental policy.
Also offered for undergraduate-levelcredit as PS 415 and may be taken only once for credit. .

## PS 516 -Political Parties and Elections (4)

An examination of political parties and elections in America. Covers such topics as: the changing role of party organizations, machine politics, electoral rules, candidate recruitment, the nomination process, campaign strategies and tactics, campaign finance, and electoral reform.
Also offered for undergraduate-levelcredit as PS 416 and may be taken only once for credit. .

## PS 517 - Interest Groups (4)

This course analyzes the role of interest groups in the political process. Particular attention is given to why some interests are more successfulat forming groups and influencing politics than others. The course also examines techniques used to lobby legis latures, the executive branch, and the courts.
Also offered for undergraduate-levelcredit as PS 417 and may be taken only once for credit. .

## PS 518-Contemporary Political Protest in America (4)

Analyzes the role of social movements in recent American history. The course blends theoretical readings with empirical research into specific movements. Movements considered include but are not limited to: civil rights, the new left, public interestreform, the freeze movement, the women's movement, the Christian Right, and the paramilitary/skinhead movement.
Also offered for undergraduate-level credit as PS 418 and may be taken only once for credit.

## PS 519-Political Reform(4)

Examines the concerns that drive the demand for political reform in America, and how specific reformproposals may affect the politicalsystem. The first part of the course focuses on a variety of proposals to open up the electoral systemand to improve representation. The second part examines various reforms that are designed to make the government work more effectively andefficiently.
Also offered for undergraduate-level credit as PS 419 and may be taken only once for credit.
PS 520 -Seminar on American Political Institutions (4)
Introduction to the field of American Politics, with a particular focus on American political institutions and their respective sub-fields within the discipline of political science.

## PS 521 - The Supreme Court and American Politics (4)

Uses selective case law in order to explore the place of the Supreme Court in America's constitutional structure and its interpretation of the relationship between the branches of federal government. Examines the way the Court forms and shapes policy through constitutionalinterpretation, and the way political forces and influences shape Court practices, judicial selection, and the decision-making process.
Also offered for undergraduate-level credit as PS 421 and may be taken only once for credit.

## PS 522 - Constitutional Law (4)

A study of the way in which the Supreme Court has shaped and influenced governmental structure and political power. Special attention is given to judicial decisions in the areas of federalism, separation of powers, the commerce clause, and the authority of the presidency.
Also offered for undergraduate-level credit as PS 422 and may be taken only once for credit. .

## PS 523 - Civil Liberties (4)

A study of Supreme Court decis ions that affect individual rights and liberties. Areas of concentration include, but are not limited to, freedom of speech and press, religious
liberty, criminal justice, racial justice, gender justice, and the right to privacy.

Also offered for undergraduate-levelcredit as PS 423 and may be taken only once for credit. .

## PS 524 -Law, Politics, andSociety (4)

Examines connection between law and the society which creates andenforces it. Law will be studied frombottom up rather than top down. Emphas is placed on what law is, how people use law, including whether access to law is equal, and how the state exercises power through law.

Also offered for undergraduate-level credit as PS 424 and may be taken only once for credit. .

## PS 525 - Women and the Law (4)

Examines the relationship between women and the law. The first half of the course considers several theories of women's equality. During the second half of the course students will apply these theories to a variety of problems in gender justice. Substantive issues covered may include: sexual harassment, abortion, fetal protection policies, and pornography.
Also offered for undergraduate-level credit as PS 425 and may be taken only once for credit.

## PS 526 - The Politics of the News (4)

Explores the role of the news media in political life and the political and economic forces shaping the news. Examines the purposes and functions of mass media in a democracy, the leg al and economic structure of the American media, and the journalistic practices and communications strategies that contribute to news coverage of politics.
Also offered for undergraduate-levelcredit as PS 426 and may be taken only once forcredit.

## PS 527 - The Politics of Public Opinion (4)

Course provides students with solid foundations for understanding thenature and evaluating the role of public opinion in American democracy. It will also teach students how to interpret public opinion polls intelligently. Specific topics covered will include how "public opinion" has been defined historically and in contemporary discourse; the various influences that shape peoples' values, beliefs, and attitudes about politics; the methods that pollsters and survey researchers use to measure public opinion and problems with those methods; and the content of Americans' views on controversial political is sues.

Also offered for undergraduate-levelcredit as PS 427 and may be taken only once for credit. .

## PS 528 - The Politics of Law and Order (4)

As American crime control policies havebecome increas ingly punitive, the criminal justice systemhas expanded in size and scope, crime control has become
increasingly federalized, and record numbers of A mericans have been incarcerated. Class explores what is political about crime control and why American crime policy takes on a particularly punitive cast. In particular, carefully examines the social construction of the crime problem: how popular beliefs aboutcriminals and the causes of crime interact with the media and the political systemto create a style of crime policy that is uniquely American.
Also offered for undergraduate-level credit as PS 428 and may be taken only once for credit. .

## PS 529 - American Immigration Politics \& Policy (4)

Exploration of American immigration politics overtime and into the current era.

Also offered for undergraduate-level credit as PS 429 and may be taken only once for credit.

## PS 530 - Proseminar in International Relations (4)

Graduate seminar surveys the main theoretical and analytical approaches encountered in the study of international relations. Themes include the grand theoretical traditions of liberalism, realis $m$, and radicalis m; analytical and methodological pers pectives, like behavioralismand rational choice theory; as well as the normative, critical, and postmodern challenges to the mains tream.

## PS 531 - State and Local Politics (4)

Intensive examination of the role of the states and cities in the federal system. The course pays particular attention to the importance of political culture in shaping state politics and power relationships between the different levels and branches of government. Oregon's political experiences are used as example and for comparis on.
Also offered for undergraduate-level credit as PS 431 and may be taken only once for credit. .

## PS 533 - Ethics and Public Policy (4)

An examination of the normative dimensions of public policy, focusing bothon the ethical is sues raised by the means of policymaking as well as the values that might shape the ends of public policy.

Cross-Listed as: This is the same course as PAP 533 and may be taken only once for credit.

## PS 535 - Disasters and Public Policy (4)

The political, adminis trative, and public policy issues surrounding major and catastrophic risks and dis asters including both natural (earthquakes, pandemics, asteroids) and man-made (climate change, nuclear weapons, bioterrorism) events.

Also offered for undergraduate-level credit as PS 435 and may be taken only once for credit. .

## PS 542 - Contemporary Theories of World Politics (4)

Surveys concepts and arguments from various theoretical traditions in international relations. Topics are drawn from the ongoing debate between the realist and liberal schools of thought, as well as the challenges posed by radical, normative, and critical international relations theory. Theories will be examined mainly for their insights on is sues of war and peace.
Also offered for undergraduate-level credit as PS 442 and may be taken only once for credit. .

## PS 543 - Resolving International Conflicts (4)

A seminar that explores different kinds of international disputes and actual conflicts in order to identify and assess theories, analytical frameworks, and methods of conflict resolution, management, and prevention. Emphasis is on understanding the roots of conflicts and techniques that may be appropriate to different levels and dimensions of conflict.

## PS 544 -National Security Strategy: Regional Perspectives (4)

Focuses on the regional contexts that influence U.S. national security strategy and the multifaceted reasons security polices succeed or fail in each region of the world. Critical analys is applied to major social, cultural, political, economic, military, technological, and his torical issues that shape formation of regional security strategy, and to strategic assessments of U.S. security policies as perceived from other regions' perspectives.
Also offered for undergraduate-level credit as PS 444 and may be taken only once for credit. .

## PS 545 - American Foreign Policy (4)

Contemporary foreign relations of the United States; objectives, world, and domestic factors affecting American foreign policy; governmental institutions concerned with development and execution of foreign policy; major is sues and problems.

## PS 546 - National and International Security Policies

 (4)A comparis on of national and international security systems, strategies, and policies. Emphas is will be on the current is sues arising in these security systems and on the problems that arise when their needs conflict. Particular emphasis will be placed on contending theories of national and international security.
Also offered for undergraduate-level credit as PS 446 and may be taken only once for credit. .

## PS 547 - International Organization (4)

The nature and extent of the organization of interaction among nations. Focus on the United Nations, but illustrations and generalization froma wide range of regional and functional org anizations including the specialized agencies. Emphasis on the processes of communication, interaction, and negotiation within the organizational environment.
Also offered for undergraduate-level credit as PS 447 and may be taken only once for credit.

## PS 548 - International Law (4)

Introduction to public international law. Particular emphas is is placed on the interplay of politics and law in the international system. Types of law, sources of law, law creating agencies, law applying agencies are considered. Contemporary substantive is sues in international law will be discussed.
Also offered for undergraduate-level credit as PS 448 and may be taken only once for credit. .

## PS 549 - International Environmental Politics andLaw

 (4)Explores various environmental problems and is sue areas that exist between and among nation-states. There will be an exploration of the political difficulties that impede solutions and the various pathways that may lead to en vironmentalcooperation. There will also be a focus on the international legal regimes and international institutions designed to regulateenvironmental problems.
Also offered for undergraduate-level credit as PS 449 and may be taken only once for credit.

## PS 552 - The European Union (4)

Focuses on how the EU has evolved since its be ginnings in the 1950s, on its present-day organization and functions, and on how the member countries interact with one another in making EU policies for jointly regulating their internal economies and societies as well as their external policies, i.e., how the EU members also try to manage their relations with the rest of the world.
Also offered for undergraduate-level credit as PS 452 and may be taken only once for credit.

## PS 553 - Power Transitions: Past, Present, andFuture

 (4)Uses powertransition theory to examine what elements contribute to global war. Creates a foundation for understanding why nations fight, when they fight, the outcome of wars, and the relationship between global and regional conflicts. Also explores the continuum of peaceful interactions at the global level, and how and when thenext series of upheavals will occur in the international system.

Also offered for undergraduate-levelcredit as PS 453 and may be taken only once for credit. .

## PS 554 - International Political Economy (4)

A study of the conten ding theories of international political economy: power and interdependence, Regime Theory, dependency, integration, and functionalis $m$, as well as the ideologies of political economy-the liberal, national, and Marxist pers pectives. Also considered are the politics of trade, aid, and investment.

Also offered for undergraduate-level credit as PS 454 and may be taken only once for credit. .

## PS 555 -Politics of Economic Reform in Emerging Market Countries (4)

Explores the process of economic reformin a comparative and international setting by focusing onemerging market countries (e.g., Argentina, Brazil, Mexico, Indonesia, Poland, Turkey, and Thailand). Des igned to give a more in-depth analysis of reformpolicies for the students. Expected preparation: PS 554.

Also offered for undergraduate-levelcredit as PS 455 and may be taken only once for credit. .

## PS 556 - Advanced Political Economy (3)

Readings seminar provides a review of the literature in theories and selected issues in international political economy. Core requirement for graduate students in the PAP doctoral programand formaster's students in political science who select international relations as their primary field of specialization.

## PS 559 - Political and Economic Decision-making (3)

Examines the philosophical and conceptual assumptions embodied in alternative decision-making theories in the fields of economics and politics. Designed to show students thedifferences in individual and collective decision-making processes and the technical and social challenges faced in decision-making processes in the market place and the realmof politics. Examples cover local, national, and international policy topics. This course is the same as USP 636; can only be taken once for credit. Recommended prerequis ite: USP 515/615.

Cross-Listed as: USP 636.

## PS 560 - Political Development in Modern Turkey (4)

Designed to provide students with an in-depth study of political development literature with a focus on modern Turkey. Examines how modern Turkish republic emerged from the as hes of the Ottoman Empire and evaluate stages of political development during the first, second, and third republic. Finally, as sesses theimplications of Turkey's new geopolitics (since the end of the Cold War) on Turkish political and economic development in a global
perspective. This course is the same as Intl 560 and may be taken only once for credit.

Also offered for undergraduate-level credit as PS 460 and may be taken only once for credit. Cross-Listed as: Intl 560.

## PS 561 - Politics of Economic Reform in Modern Turkey (4)

This course is designed to providestudents with an in depth study of political development literature with a focus on modern Turkey. We will examine how modern Turkish republic emerged fromthe ashes of the Ottoman Empire and evaluate stages of economic development during the first, second, and third republic. Finally, we will as sess the implications of Turkey's new geopolitics (since the end of the Cold W ar) on Turkish economic development in a global perspective. This course is the same as Intl 561 and may be taken only once for credit.
Also offered for undergraduate-level credit as PS 461 and may be taken only once for credit. Cross-Listed as: Intl 561.

## PS 562 - International Relations of the Middle East (4)

Examination of the external dimension of Middle East politics; the role of the great powers; brief analy sis of the British and French roles since 1945; extended analysis of American and Soviet/Russian policy in the Middle East. Special attention will be given to new patterns of international relations in the Middle East in the post- Cold War, post-Gulf W ar era.

Also offered for undergraduate-level credit as PS 462 and may be taken only once for credit. .

## PS 563 - Politics andPolicy of the Middle East (4)

Examines conceptual debates in comparative politics and international relations of the Middle East. Focuses on state formation; authoritarian politics, political regimes, and institutions; public opinion, Islamist movements; gender and politics; political economy; the Is raeli-Palestinian conflict, and regional and international relations of the greater Middle East.

## PS 565 - Politics of Russia (4)

An in-depth exploration of Russian politics, history, and culture. Begins with a focus on history, and thus considers the beginnings of the Russian Empire across the centuries. Then examines the rise and fall of communis $m$, with a particular focus on Lenin and Stalin. The final segment of the course focuses on modern Russian politics, with a particularemphasis on the strategies and success of Vladimir Putin.

Also offered for undergraduate-level credit as PS 465 and may be taken only once for credit.

## PS 566 -Politics of China (4)

A survey of the historical, ins titutional, and social roots of contemporary politics in China as well as a consideration of several public policy areas.
Also offered for undergraduate-level credit as PS 466 and may be taken only once for credit.

## PS 568 - International Politics of East Asia (4)

Examination of the foreign policy motives, objectives, and systems of the major East Asian states: China, Japan, and Korea. Attention is paid in particular to the political economy of regional and extra-regional relationships.

Also offered for undergraduate-levelcredit as PS 468 and may be taken only once for credit.

## PS 569 - Comparative Political Institutions (4)

Examines the performance, capabilities, and overall function of governments worldwide. Emphas is on advanced analyses of theories and concepts in comparative politics, with a particular focus on institutions of the state.

## PS 570 - Theories of Comparative Politics (4)

Examines the evolution of the theories and methods of comparative politics, addressing both the recent history of the discipline and the current state of its practices. Topics include: the behavioral revolution, political development, the role of state, the new institutionalism, and the state-insociety approaches.
Also offered for undergraduate-level credit as PS 470 and may be taken only once for credit. .

## PS 571 - Gender \& Politics: A Comparative Perspective

 (4)Examination of the role, progress, behavior, and power of women in politics using a comparative lens. Topics include the representation of women in government, the problems confronting female candidates, the behavior of women officeholders, and the gender gapin politics. Examines women in western democracies, as well as in communist states and developing nations. Individual countries are used as case studies.
Also offered for undergraduate-levelcredit as PS 471 and may be taken only once for credit. .

## PS 572 -Democratization and Authoritarianismin the Middle East and North Africa (4)

Introduction to theoretical, empirical, and methodological debates in the comparative and international relations of the Middle East. Examination of contemporary political, economic, and social topics, including institutions and regimes, politicaleconomy, women and politics, Is raeliPalestinian conflict, and regional and international affairs.

Also offered for undergraduate-level credit as PS 472 and may be taken only once for credit.

## PS 573 - Government and Politics of Arab North Africa

 (4)Examines the domestic and international politics of Arab North Africa, including Morocco, the Moroccan/Western Sahara, Mauritania, Algeria, Tunisia, Libya, and Egypt. Topics include the history of the region, political regimes and authoritarianism, the Arab spring, women's rights, and U.S.-Maghrebi relations.

Also offered for undergraduate-level credit as PS 473 and may be taken only once forcredit. .

## PS 574 - Democracy and Development in Latin America (4)

Examines issues of democracy and development in Latin America. It addresses such topics as the role of history, political culture, political leadership, political institutions, the state, the military, civil society, social clas ses, level of socio-economic development, and their relationship to the possibilities of success or failure for democracy in Latin America. The course examines specific cases such as Argentina, Brazil, Mexico, Chile, Peru, Venezuela, and Uruguay.
Also offered for undergraduate-level credit as PS 474 and may be taken only once for credit. .

## PS 575 - Comparative Political Parties andElections (4)

Parties and elections are crucial elements of governancein countries around the world. But while these institutions are omnipresent, there are differences in the power and behavior of political parties as well as in the function and outcome of legislative electoral systems. In this course, we examine those differences with a focus on representation, party survival, and electoral behavior, and performindepth case studies of elections in such countries as Germany, Russia, Japan, and Brazil.
Also offered for undergraduate-level credit as PS 475 and may be taken only once for credit.

## PS 576 - Politics of Inequality in the United States (4)

Examines three themes: 1) How and why did economic inequality explode in the U.S. in recent decades? This level of inequality is notinevitable. We look to American politics for ans wers. 2) How does economic inequality intersect with other forms of inequality (e.g., gender, race, and place)? and 3) What is to be done? Students will draw from their pers onal experiences with inequality via exercises and assignments.
Also offered for undergraduate-level credit as PS 476 and may be taken only once for credit.

## PS 577 -Global Food Politics and Policy (4)

Politics and policy of food production and consumption in both rich and poor nations. Review of competing policy arguments across is sues relating to food security, markets and market access, and the environment and public health.
Also offered for undergraduate-levelcredit as PS 477 and may be taken only once for credit. Prerequisite:Upperdivis ion standing or graduate standing.

## PS 578 -Comparative Democratic Institutions (4)

Examines differences in how democratic governments are structured across the globe and what these differences mean for governing. Explores differences both among and between presidential, parliamentary, and semi-presidential political systems. Examines federal and unitary political structures, and the role of supreme courts. Field trip to observe alternative democratic system.
Also offered for undergraduate-levelcredit as PS 478 and may be taken only once for credit.

## PS 579 - Transitions to Democracy (4)

Comparative analysis of political systems which have experienced a transition from an authoritarian to a democratic regime. Attention is given to the conditions supportive of democratic transition and to the problems of maintaining democratic stability.
Also offered for undergraduate-levelcredit as PS 479 and may be taken only once for credit. .

## PS 581 -Democratic Theory (4)

Critical examination of the principles of democratic politics, including important statements in the his tory of political thought and contemporary political theory. Issues discussed include participation, deliberation, electoral competition, constitutionalism, and the challenges of democratic legitimacy in the context of US institutions and increasing globalization.
Also offered for undergraduate-levelcredit as PS 481 and may be taken only once for credit. .

## PS 582 -Liberalismand Its Critics (4)

Critical examination of the theory and practice of liberalism as an ongoing tradition. The basic elements of liberalism are identified and discussed and criticisms of the liberal tradition, as offered by communitarians, classical republicans, feminists, and postmodernists, are examined. Liberal responses to these criticis ms are also explored.
Also offered for undergraduate-levelcredit as PS 482 and may be taken only once for credit. .

## PS 583 - Justice in the Modern World (4)

Critical analys is of the nature and meaning of social justice. Special attention is given to liberal theories of justice, questions of distributive justice, justice and the rule
of law, inter-generational justice, and political alternatives to the liberal vision of social justice.
Also offered for undergraduate-level credit as PS 483 and may be taken only once for credit. .

## PS 584-Conservatism(4)

Studies classical and contemporary works of conservative political thought, with a focus on how these theories have been applied to political practice.
Also offered for undergraduate-level credit as PS 484 and may be taken only once forcredit.

## PS 585 - Political Theory and Governance (4)

A survey of the intersection between political theory and governance that explores how political legitimacy might be understood. This class is a graduate-level introduction to these concepts that engages with a broad range of political theorists and approaches to offer the means of evaluating contemporary governance froma normative perspective.

## PS 586 - American Political Thought: 1600 to 1820 (4)

The development from 1600 to 1820 of American political thought aboutgovernment and its proper relation to the individual and society. Specific topics considered include the English background; the colonial mind; ideas informing the revolution; the creation of the Constitution; and the ratification debates; the Jeffersonian and Hamiltonian conflict; John Marshall and the expansion of national power. Attention given to bringing to the surface the fundamental, often inarticulate, patterns, and presuppositions of A merican thought about political things.
Also offered for undergraduate-level credit as PS 486 and may be taken only once for credit.

## PS 587 -American Political Culture: 1820 to the Present (4)

The development from 1820 to the present of American political thought about government and its proper relation to life, liberty, property and the pursuit of happiness. Topics considered includedemocratization and the Jacksonian period, slavery, and the nature of the Union, Social Darwinism and industrialization, the progressive period, the coming of the welfare state, and contemporary concerns. Attention given to bringing to the surface the fundamental, often inarticulate, patterns, and presuppositions of American thought about political things.
Also offered for undergraduate-level credit as PS 487 and may be taken only once for credit.

## PS 588-Political Scientist Professionalization (2)

This is a skill-building course that focuses on developing two sets of practical skills that allfuture political scientists working in academia will need: first, the skills necessary to
create a top-quality application package that will get students into top-ranked Political Science PhD programs, and second, the skills to revise written work into an excellent writing sample or conference paper.

## PS 589 -How to Teach and Present Social Science Research (2)

Focuses on the skills necessary for designing and teaching a political science course and delivering effectiveresearch presentations at conferences. Students will spend the first half of the course on teaching skills and the second half on building and works hopping presentations, emphasizing skills such as public speaking, building effective slideshows and other visuals, and communicating research to audiences with mixed levels of expertise.

## PS 590 - Introduction to Graduate School: Skills for Scholarly Success (1)

Welcomes students to the graduate environment and culture of academia. Des igned for the first quarter of graduate study, this course focuses on developing es sential skills for success in graduate leveleducation, such as: how to read academic literature, note-taking and seminar noms, and understanding the prospectus requirement. Also teaches skills to navigate the often-competing demands on graduate students' time, and develops the students' academic toolkit which will serve them throughout their career.

## PS 591 - Testing Theories in Political Science (4)

Survey of the most common methods used to evaluate empirical questions in political science research and as sess the adequacy of theories. The course prepares students to interpret, critique, design, and conduct social scientific analys is. It examines both qualitative and quantitative methodologies, including case study, content analysis, interviewing, surveys, participant observation, field experiments, and statistical analysis. PS 591 is required for graduate students in the political sciencemaster's program and should be taken after PS 594.
Also offered for undergraduate-level credit as PS 491 and may be taken only once for credit.

## PS 593 - Philos ophy of the Social Sciences (4)

An analysis of the practical challenges and competing approaches to the practice of social science, es pecially political science. Subjects considered include the aims of social science, concepts and description, causality, rationality, macro and micro explanations, interpretation, and postmodernism.

Also offered for undergraduate-level credit as PS 493 and may be taken only once for credit.

## PS 594 - Research Design for Politics and Policy (4)

This course will introduce the logic of social science research and provide a brief overview of the various methods that are commonly used. The focus is on developing design skills that will help clarify research ideas, organize research design and research questions of interest to students.

Cross-Listed as: This is the same course as PAP 690 and may be taken only once for credit.

## PS 595 - Topics in Specialized Res earch Methods for Political Science (4)

An examination of a specialized methodological approach and/or technique for interpreting and conducting empirical political science research. Each quarter will offer in-depth coverage of a single topic; topics will vary fromquarter to quarter dependent on student interests and instructor specialty. Sample topics include: network analysis, survey research, qualitative methods, formal modeling, maximum likelihood estimation, or usage of specific statistical software applications. Expected preparation: Mth 243, Mth 244, and/or PS 491. This course may be repeated for credit with different topics.
Also offered for undergraduate-level credit as PS 495.
PS 603 - Dissertation (1-12)
(Credit to be arranged.)

## PS 605 - Reading and Conference (1-6)

(Credit to be arranged.)

## PS 663 - Politics andPolicy of the Middle East (4)

Examines conceptual debates in comparative politics and international relations of the Middle East. Focuses on state formation; authoritarian politics, political regimes, and institutions; public opinion, Islamist movements; gender and politics; political economy; the Is raeli-Palestinian conflict, and regional and international relations of the greater Middle East.

## Psy - Psychology

## Psy 200 - Psychology as a Natural Science (4)

Covers the scientific foundations of human behavior in areas such as physiological and biological psychology, cognitive, moral, and emotional development, sensation and perception, consciousness, learning, thinking and memory. Also focuses on is sues in experimental design
and teaches students how to critically evaluate psychological research.

## Psy 204 -Psychology as a Social Science (4)

Explores human individuality and the social context of behavior. Topics include intelligence, personality, motivation, social psychology, coping with stress, and ps ychological disorders. Describes theories and research findings in the context of social is sues and introduces students to challenges of psychological meas urement. Recommended as a first ps ychology course for both majors and nonmajors.

## Psy 207 - Introduction to Applied Psychology (4)

A survey of selected applications of concepts and methodologies from the different areas of psychology such as experimental, industrial/organizational, social, and developmental. Recommended prerequisites: Ps y 200, 204.

## Psy 299 -Special Studies (1-4)

(Credit to be Arranged.)
Prerequisite: Psy 204.

## Psy 300U- Personal Decision Making (4)

How to make wiser decisions. Ways to think more creatively and more logically in making both everyday choices and major life decis ions. Instruction and hands-on experience.

## Psy 310U- Psychology of Women (4)

Review and evaluateassumptions underlying psychological research on women. Survey the research in areas such as the development of sexdifferences, acquisition of gender roles and maintenance of gender stereotypes. Explore the pertinence of these findings to topical areas such as women's work roles, women and mentalhealth, and the women's movement. Recommended prerequisite: 4 credits in psychology.

## Psy 311U- Human Development (4)

Development of the individual across the lifespan, from conception to death. Surveys the biological bases and social contexts of developmental processes (e.g., cognitive, social, emotional development). Implications of research for education, parenting/family relations, and social policy. Recommended prerequisites: Psy 200 and 204, or appropriate Sophomore Inquiry course.

## Psy 315 - Careers in Ps ychology (4)

The coursecombines career considerations with exploration of multiple aspects of psychology as a discipline and their relevance to student futures. Exposure to faculty, graduate students and employers will help ground decisions about employment and graduate school, broadening perspective on what it is to be a knowled geable, psychologically literate citizen.
Prerequisite: Psy 204.
Psy 317 -Personal and Social Adjustment (4)
Traces the course of normal adjustment with special interest in those factors which are instrumental in shaping human behavior. Concepts such as emotional maturity, psychological stress, and maladjustment are considered. Recommended prerequisite: 4 credits in 200-level psychology.

## Psy 320 - Social Science Research Methods II (4)

Introduction and application of statistical modeling to psychological data. Guidance and practice in the interpretation and reporting of common statistical tests and software use. Topics include descriptive statistics, comparis ons of means among groups, relations among variables, statistical model specification with multiple predictors, and the analysis of categorical data.
Prerequisite: Stat 243 or Soc 396.

## Psy 321 - Research Methods in Psychology (4)

Study of methods for evaluating the quality of psychological measurements, including various concepts of reliability and validity, and itemanalysis techniques; common sources of invalidity in the interpretation of psychological data; strategies of selecting and analyzing observations which minimize these sources of in validity. Recommended prerequisites: Stat 243,244 , and 4 credits in psychology.

## Psy 340 - Principles of Behavior Analysis (4)

A course in the concepts of behavior analysis. Includes presentation of respondent and operant conditioning, extinction, response differentiation, schedules of reinforcement, shaping, es cape and avoid ance behavior, stimulus discrimination, punishment and similar concepts. The course is intended to provide thestudent with a thorough introduction to a developing technology of behavior.

## Psy 342 -Social Psychology: Self, Attitudes and Social Influence (4)

Examination of psychological and sociological processes as sociated with people's thoughts about and interactions with one another. Particular emphases on self, social identity, social cognition, attitudes, prejudice and persuasion. Expected preparation: Soc 200, or Psy 200 or 204. Credit will not be given for both Soc 342 and Psy 342.

## Psy 343 -Social Psychology: Social Relationships and Groups (4)

Examination of sociological and psychological processes as sociated with interpersonal, group, and inter-group behavior. Particular emphases on aggression, pro-social behavior, interpersonal attraction, group influence, conflict and cooperation. Expected preparation: Soc 200, or Psy 200 or 204. Credit will not be given for both Soc 343 and Psy 343.

## Psy 345 -Motivation (4)

A course on the causes for acquiring, choosing, or persisting in specific actions within specific circumstances. Students review the conditions, principles, and theories of motivation. Recommended prerequisite: Psy 200 or 204.

## Psy 346 -Learning (4)

Conditions, principles, and theories of learning. Assessment of experimental methods and results in relation to current theory. Recommended prerequisite: 4 credits in 200-level psychology.

## Psy 347 -Perception (4)

Introduction to the principles and theories of visual and auditory perception. Topics include sensory pathways, color perception, perceptual illusions, and the role of knowledge and cognitive factors in perception. Recommended prerequisite: Psy 200.

## Psy 348 - Cognition (4)

Proces ses by which we form representations of reality, and strategies we use for manipulating those representations in order to explore possible actions and outcomes. Includes topics in perception, attention, memory, imagery, language, comprehension, problemsolving, creative thinking, judgment, reasoning, and decision making. Recommended prerequisite: 4 credits in 200-level psychology.

## Psy 350 - Counseling (4)

A survey of counseling and interviewing procedures, contributions of psychological theory to counseling techniques. Recommended prerequisite: 4 credits in 200levelpsychology.

## Psy 357 - Comparative Psychology (4)

A study of the behavioral differences and similarities within the phylogenetic scale. Emphas is on the examination of the evolution of the behavior of individuals and species, paying particular attention to the basic concepts of psychology, such as sensation, perception, learning, and social processes. The role of animals in theories and as models forhuman behavior. Recommended prerequisite: 4 credits in 200- level psychology.

## Psy 360 - Industrial/Organizational Psychology (4)

The scientific study of human behavior in work settings, covering the adjustments people make to the places they go, the people they meet, and the things they do in their occupational activities of alltypes. Recommended prerequisite: Psy 200 or 204.

## Psy 361 - Industrial Psychology (4)

Overview of the scientific study of people in work settings, including job analysis, the meas urement of individual differences forhiring and promoting workers, the as sessment of employee performance through performance apprais al systems, and employee training. Course contains a substantial component focused on application through a community-based learning or class project.

## Psy 362 - Organizational Psychology (4)

Overview of the scientific study of people in work settings, including work motivation, leadership, organizational change and development, group processes, work and family is sues, stress, job attitudes, and occupational health psychology. Course contains a substantial component focused on applications such as community based learning or clas projects.

## Psy 399 -Special Studies (1-6)

(Credit to be arranged.)

## Psy 401 - Research (0-6)

(Credit to be arranged.) Consent of instructor.

## Psy 402 - Independent Study (1-12)

(Credit to be arranged.)

## Psy 403 -Thesis (1-12)

(Credit to be arranged.)

## Psy 404 - Cooperative Education/Internship (0-12)

(Credit to be arranged.)

## Psy 405 - Reading and Conference (1-6)

(Credit to be arranged.) Consent of instructor.

## Psy 406 -Special Projects (1-12)

(Credit to be arranged.)

## Psy 407 -Seminar (1-6)

(Credit to be arranged.) Consent of instructor.

## Psy 409 - Practicum(0-12)

(Credit to be arranged.) Supervised psychological practice including observing, studying, and participating in the activities of private settings or community service agencies such as: schools, mental health clinics, correctional agencies, and day care centers. Supervision may include guided reading, daily journals, and evaluative reports.

## Psy 410 -Selected Topics (1-6)

(Credit to be arranged.)

## Psy 413 - Ecops ychology (4)

Course explores a range of topics regarding the humannature relationship, including humans as an inseparable from nature, influences of built and natural environments on mind and behavior, psychological theory and strategies for addressing environmental problems, evolutionary and cultural factors, and the use of nature in therapy.
Discussions, lecturettes, experiential, guest-speakers.

Also offered for graduate-level credit as Psy 513 and may be taken only once for credit. Prerequisite: Psy 200, Psy 204, and Psy 321.

## Psy 425 - Psychology of Black Manhood in America (4)

Examines the psychological underpinnings of the Black male experience in American culture; looks at the "inv is ibility syndrome" and the impact of dis crimination on mental, emotional, and physical health. In addition, consideration will also be given to understanding the ways racism, medicalneglect and malpractice, stereotypes, and various forms of trauma negatively impacts perceptions of self.
Prerequisite: Upper-division standing.

## Psy 426 - Ps ychology of Stigma \& Social Inequality (4)

Inves tigates the ways in which individuals perceive, respond to, perpetuate, and work to dis mantle stigma and socialinequality. We will delve into classic and contemporary work, touching on topics including: why do we stigmatize? How and why do we justify social inequality? How do stigma and social inequality affect our health, well-being, and interactions with others? We will also think deeply abouthow to apply our knowledge to current social is sues and policy.

Prerequisite: Upper-division standing.

## Psy 427 -History and Systems of Psychology (4)

A survey of the history of psychology and of past and current theoretical approaches in psychology. Study of the historical roots of current theories in perception, learning, motivation, personality and other fields. Expected preparation: Stat 243 and Stat 244, at least 18 credits in psychology, including Psy 321.

Also offered for graduate-level credit as Psy 527 and may be taken only once for credit. .

## Psy 428 - Diversity, Prejudice and Intergroup Relations

 (4)Delves into social psychological research and theory on Prejudice, Diversity, and Intergroup Relations. Froma socialpsychological pers pective, it addresses both historical and contemporary perspectives on stereotyping, prejudice, and discrimination, including implicit bias, modern racis $m$, social identity threats, and benevolent sexism. Example topics include the impact of prejudice in policing, education, work organizations, online mediums, and health care. The course also focuses on ways to reduce prejudice and counteract bias.
Prerequisite: Upper-division standing.

## Psy 429 - The Psychology of Race \& Gender in Sport (4)

Using a social psychological approach, this course will examine how is sues of race and gender affect the sporting
domain. Specifically, the course will emphasize how social psychological theories of intergroup relations, stereotyping, prejudice, and dis crimination impact athletes, coaches, referees, and fans.
Prerequisite: upper-division standing.

## Psy 430 - Applied Social Psychology (4)

Explores current and potential applications of social psychological theories and research methods, with a focus on work conducted in field settings. As a final project, each student examines an applied area of their own choosing (previous projects have focused on normative role transitions, responses to natural dis asters, political attitudes, conflict resolution, and intergroup relations). Expected preparation: Stat 243 and Stat 244, Psy 321, Psy 342, or Psy 343.
Also offered for graduate-level credit as Psy 530 and may be taken only once forcredit. .

## Psy 431U- Psychology of Men and Masculinities (4)

Reviews various social and personality theories that describe the psychology of men and the diverse forms and expressions of masculinity across cultures. Applies these theories to a wide range of is sues in men's lives, including emotions, health, work and family roles, sexuality, relationships, and violence.
Prerequisite: fourcredits in psychology.

## Psy 432 - Personality (4)

Personality structure and theory. Recommended prerequisite: Stat 243 and 244, eight credits in ps ychology, including Psy 321.

## Psy 433 - Introduction to Psychological Testing (4)

Covers theoretical and practical is sues related to psychological tests used in educational, organizational, and clinical settings. Testing areas covered include intelligence, personality, values, interests, moral development, aptitudes and psychological dis orders. Students will learn how to evaluate the quality of a psychological test and how to make informed choices about whether a test is appropriate for a particular setting. Recommended prerequisites: Psy 321 and Stat 243 and 244.

## Psy 434 - Introduction to Psychopathology (4)

Course content will survey the development of modern ideas of mental illness, the origins of mental illnesses, the diagnostic system and the clinical syndromes, and methods of treatment of neuropsychiatric disorder. This course does not produce diagnosticians of mentalillness but is a preparation for the clinical study of diagnosis. Expected preparation: Psy 200, Ps y 204, Stat 243 and Stat 244, and
at least 6 additional credits in psychology, including Psy 321.

Also offered for graduate-level credit as Psy 534 and may be taken only once for credit. .

## Psy 436 - Performance Appraisal and Feedback (4)

Applications of psychological concepts to the development of performance appraisal systems in organizations. Topics include job analysis, cognitive processes in performance apprais al, types of rating scales, rater training methods, technical as pects of developing a performance appraisal system, performancefeedback, individuals' reactions to performance feedback factors related to the perceived accuracy of performancefeedback. Recommended prerequisites: Stat 243 and 244, Psy 321 and 360 or 361 .

## Psy 440 - Group Process (4)

A course on the psychology of small groups. Topics will include but not be limited to: interpers onal attraction, stages of group development, group structure, coalition formation, pers onal power, leadership, group decision making and problemsolving, intergroup relations and the principles of negotiation. Expected preparation: Stat 243 and Stat 244, Psy 321, graduate standing or consent of instructor.

Also offered for graduate-level credit as Psy 540 and may be taken only once for credit. .

## Psy 444 - Job Analysis (4)

Methods (e.g., interviews, surveys) used to collect information about jobs for use in human res ource functions such as personnel recruitment and selection, training, performance appraisal, and compensation. Such information is also used to developjob descriptions and specifications. Course contains a community-based learning component. Students participate in a full job analys is including data collection, analysis, and interpretation. Expected preparation: Stat 243 and Stat 244; Psy 321 and Psy 360 or Psy 361 ; or comparable Business Adminis tration courses.
Also offered for graduate-level credit as Psy 544 and may be taken only once for credit. .

## Psy 445 - Employee Development (4)

Covers the application of psychological principles to employee training and development. Topics include organization, job, and person analysis; programdesign; the application of learning principles to enhance training effectiveness; evaluation of training programs; and employee training and development methodology. A heavy emphas is is placed on current psychological research. This course may include a community-based learning component. Expected preparation: Stat 243 and Stat 244; Psy 321 and Psy 360 or Psy 361.

Also offered for graduate-level credit as Psy 545 and may be taken only once for credit. .

## Psy 447 -Pers onnel Psychology (4)

How individual differences affect work behavior and task performance and how psychologists measure and predict such differences. Covers the development, adminis tration, and utility of modern instruments for selection and appraisal. Data combination strategies and decision making in pers onnel systems are dis cussed. Expected preparation: Stat 243 and Stat 244, Psy 321 and Psy 360 or Psy 361.

Also offered for graduate-level credit as Psy 547 and may be taken only once forcredit. .

## Psy 448 - Psychology of Work Motivation (4)

Examination of the role that motivation plays in initiating, guiding, and maintaining work behaviors. Discussion of job attitudes, emotional intelligence, personality factors, socialization and culture, effects of participation, careers, job enrichment, re-engineering, and power and politics. Expected preparation: Psy 321.

Also offered for graduate-level credit as Psy 548 and may be taken only once for credit. .

## Psy 449 - Survey of Human Factors (4)

An introduction to systems analysis concepts. An examination of the role of man and his interrelationships with complex man-machine systems. Topics include: manmachine systems, vis ual and auditory presentation of information, design of controls, layout of work places, effects of environment on human performance, and the physical limits of human performance. Recommended prerequisites: eight credits in psychology; Stat 243,244, and Psy 321.

## Psy 450 - Psychopharmacology (4)

How do drugs affect us? Discover the structure and function of the nervous system, techniques used to study drug actions and effects, and the specific molecular and behavioral influence of alcohol and other drugs, including opioids, psychostimulants, cannabinoids and psychedelics.
Prerequisite: Upper division standing.

## Psy 451 -Introduction to Neurophysiological

 Psychology (4)The study of the nervous system, various anatomical, neurophysiological, and imaging techniques for studying the brain and behavior, including specific cognitive abilities such as sensation, perception, attention, language, and emotion.
Also offered for graduate-level credit as Psy 551 and may be taken only once for credit. . Prerequisite: Junior standing.

## Psy 452 - Advanced Neurophysiological Psychology (4)

Explore current federally funded topics in neurophysiology, acquire skill in reading and presenting original research, visit the Oregon National Primate Research Center and learn alongside area graduate students and postdocs in neuroscience.

Prerequisite: Psy 347 or Psy 450 or Psy 451.

## Psy 454 - Experimental Psychology (5)

Principles of experimentaldesign, evaluation of research methods, formulation and testing of hypotheses using research procedures, use of statistical software for analyzing the research data, writing a research manuscript using APA form. Recommended prerequisites: at least 12 credits in psychology including Psy 321 and at least one of the following: Stat 243 and 244.

## Psy 455 - Experimental Psychology (4)

Principles of experimentaldesign, evaluation of research methods, formulation and testing of hypotheses using research procedures, use of statistical software for analyzing the research data, writing a research manuscript using APA form. Recommended prerequisites: at least 12 credits in ps ychology including Psy 321 and at least one of the following: Stat 243 and 244.

## Psy 458 - Development \& Education of AfricanDiaspora Children \& Youth (4)

Explores developmentfromchildhood through emerging adulthood for persons in the African-diaspora using a sociocultural psychology perspective. Individual AfricanAmerican children and youths' interactions with local, distal, and sociohistorical contexts will be discussed as sources of developmental trajectories. Special attention will be given to schooling as a developmental context and critical psychology perspectives.

Prerequisite: Upper-division standing.
Psy 459 - Infant Development (4)
Development of the individual fromconception to age two. Theory and research pertaining to infant development.

## Psy 459U- Infant Development (4)

Development of the individual fromconception to age two. Theory and rese arch pertaining to infant development.
Prerequisite: Upper-division standing.
Psy 460 - Child Psychology (4)
Development of the individual fromconception through childhood. Theory and research pertaining to child
development. Expected preparation: Stat 243 and Stat 244, Psy 311 and Psy 321.
Also offered for graduate-level credit as Psy 560 and may be taken only once forcredit. .

## Psy 461 U- Psychology of Adolescence and Early Maturity (4)

Development of the individual frompuberty to early adulthood. Theory and research pertaining to adolescent development.
Prerequisite: Upper-division standing.

## Psy 462 - Psychology of Adult Development and Aging

 (4)Development of the individual fromearly adulthood through old age. Theory and research focusing on adult development from a life-span perspective. Expected preparation: Stat 243 and Stat 244, Psy 311 and Psy 321 plus one of the following: Psy 459, Psy 460, or Psy 461.
Also offered for graduate-level credit as Psy 562 and may be taken only once for credit. .

## Psy 463 -Development and Education of Immigrant

 Children and Youth (4)This undergraduate seminar course will focus on the development and education of children and youth from immigrant backgrounds, primarily in the U.S. The course readings are selected to be broad in scope but will focus on original scholarship and current research on the education and development of immigrant children and adolescents. The course will cover topics such as acculturation, ethnic identity, school experiences, and major sources of risk and resilience among children fromimmigrant backgrounds.
Prerequisite: Upper-division standing.

## Psy 464 -Developmental Psychopathology (4)

Study of the origins and course of individual patterns of behavioral adaptation and malad aption. Application of developmental principles to an understanding of social, emotional, and conduct disorders of children and their outcome in adult life. Expected preparation: Stat 243 and Stat 244, Psy 321 and Psy 434 plus 8 credits in courses numbered Psy 459-461.

Also offered for graduate-level credit as Psy 564 and may be taken only once forcredit. .

## Psy 465 - Applied Developmental Psychology (4)

Theory, methods, and research in selected areas of applied developmental ps ychology. Expected preparation: Stat 243 and Stat 244, Psy 311 and Psy 321 and consent of instructor.

Also offered for graduate-level credit as Psy 565 and may be taken only once forcredit. .

## Psy 467 - Work and Family (4)

An examination of the effects of work on family, and family on work, in contemporary society. Includes study of dual-career and dual-work families, effects of maternal employment on children, impact of child care and elder care on the workplace, and parental leave and other workplace supports for families. Implications of research for social policy. Expected preparation: Stat 243 and Stat 244, Psy 311 and Psy 321.
Also offered for graduate-level credit as Psy 567 and may be taken only once for credit. .

## Psy 468 -Social Development (4)

Development of individual's social relationships from infancy to adolescence. Theory and research pertaining to socialdevelopment froman interactional perspective. Expected preparation: Stat 243 and Stat 244, Psy 311 and Psy 321 and one of the following: Psy 459, Psy 460, Psy 461, or Psy 462.

Also offered for graduate-level credit as Psy 568 and may be taken only once for credit. .

## Psy 469 - Ps ychology of Human Sexuality (4)

Explores questions relating to sexuality, with a particular emphas is on the psychological aspects of sex. We will discuss gender roles, gender identity, sexual orientation, relationships, sexual aggression, pornography, contraception, pregnancy, abortion, sexuality across the lifespan, and cultural influences that impact decisions we make about sex. This course is designed to increase awareness and sensitivity to sexuality and is sues relating to it.

Prerequisite: Upper-division standing.

## Psy 470 -Diversity in the Workplace (4)

Explores human diversity in workplace contexts, with an emphas is on the psychological as pects of diversity and management. We will first cover the ps ychology of diversity and inclusion and proceed to cover the perspectives of several different employee groups. We will also discover relevant theoretical and practical cons iderations concerning strategies for implementing effect diversity management policies and procedures.

Prerequis ite: Upper-division standing.

## Psy 471 - Health Psychology (4)

Study of the social and psychological influences on how people stay well, why some people become ill, and how persons respond to illness. Particular attention to the stress process. Expected preparation: Stat 243 and Stat 244, plus 12 credits in psychology, including Psy 321; Soc 200 may be substituted for 4 of these credits andPHE 223 may be substituted for 4 of these credits.

Also offered for graduate-level credit as Psy 571 and may be taken only once for credit. .

## Psy 478 -Leadership and Group Effectiveness (4)

Study of leadership in s mallgroups with an emphasis on interpers onal influence processes. Leadership is viewed as statements or actions intended to influence a group's efforts toward goal setting and achievement. Includes discussion of leadership training/development, and self-awareness of style. Expected preparation: Psy 321.

Also offered for graduate-level credit as Psy 578 and may be taken only once for credit. .
Psy 479 - Women and Organizational Psychology (4)
Examines the relationship between gender and work in different kinds of organizations across the economy. Focus is on the ways that gender influences such experiences as stress, hiring and career development, leadership opportunity, group interactions and organizational relationships, and the ways the greater understanding of gender/work interactions can influence individual experience and result in strategies for change.
Recommended prerequisites: Stat 243 and Stat 244, Psy 310 and Psy 321.

## Psy 480 - Community Psychology: Empowerment,

 Action, and Social Change (4)Community Psychology seeks to understand the relationship between individual well-being and diverse environmental influences, fromfamilies and neighborhoods to culture and mas s media. In this course, students will learn major theories and concepts in the field, apply them to pres sing social is sues, evaluate their implications for research, practice, and policy.

Also offered for graduate-level credit as Psy 580 and may be taken only oncefor credit. . Prerequisite: upper-division standing.

## Psy 484 - Principles of Behavior Modification (4)

A survey of recent developments in the application of behavior theory to problems of ps ychological adjustment. The course includes treatment of the behavioral concept of "abnormal", and the development of a technology of behavior therapy. The course is intended for advanced students in psychology, social work, special education, speech pathology, and nursing. Expected preparation: Psy 346.

Also offered for graduate-level credit as Psy 584 and may be taken only once forcredit. . Prerequisite: Psy 340.

## Psy 485 -Self-modification of Behavior (4)

The technology of self-change developed within the framework of behavior modification theory, including relevant ethical and theoretical is sue 4 s , specific techniques
of change and the application of these techniques within a systematic programdevelopment model. Expected preparation: Psy 346.
Also offered for graduate-level credit as Psy 585 and may be taken only once for credit. . Prerequisite: Psy 484.
Psy 486 - Human Performance and Mental Workload (4)

Introduction to mathematical and conceptual theories of how the human performs simple and complicated tasks. Topics include signal detection theory, information theory, reaction time, attention, effort. Measures and theories of mental workload will be discussed as well as what leads to cognitive overload and how it can be altered.
Recommended prerequisites: Psy 321, Stat 243 and 244, and 12 credits of psychology.

## Psy 487 -Life-span Development (4)

Theories and methodology for the study of processes and change in life-span developmental pers pective. Practical implications of different perspectives for theories and research regarding human development. Expected preparation: Stat 243 and Stat 244, Psy 311 and Psy 321 plus 8 credits in courses numbered Psy 459 , Psy 460 , Psy 461, or Psy 462.

Also offered for graduate-level credit as Psy 587 and may be taken only once for credit. .

## Psy 491 - Decision Making I: Values \& Choice (4)

Normative models, descriptive models, and cognitive aids for structuring decision problems, evaluating consequences of alternative courses of action, and choosing among alternatives.

Prerequisite: Stat 243 and 244, Psy 321 and 348; or permission of instructor.

## Psy 492 - Decision Making II: Judgement and Reason (4)

Contact the department for a description of this course.

## Psy 493 - Decision Making Laboratory (4)

Practice in the use of judgment techniques and decision software to structure decision problems, evaluate alternative courses of action, perform sensitivity analyses, and prepare presentations. Wherever possible, practice will be on current decision problems in field settings. Expected preparation: Psy 491, Psy 492.

Also offered for graduate-level credit as Psy 593 and may be taken only once for credit. .

## Psy 495 -Psychological Measurement (4)

Development, validation, and applications of psychological tests. Students will learn about various types of psychological tests, the is sues of reliability, validity, item analysis, and standardization of tests, and ethics in choosing and applying tests. There will be both lecture and lab portions required.

Prerequisite: Stat 243 and 244, and Psy 321.

## Psy 497 - Applied Survey Research (4)

Provides theoretical framework for and experience in design, execution, and interpretation of social surveys including sampling procedures, questionnaire design, interviewing techniques, coding and computer analysis, and report writing. Expected preparation: Stat 243 and Stat 244, Psy 321.

Also offered for graduate-level credit as Psy 597 and may be taken only once for credit. .

## Psy 498 - Field Obs ervation Methods (4)

Applied experience in the major methodological techniques offield observation, as well as the key problems of validity and reliability as they arise while developing a behavioralobservation system. Expected preparation: Stat 243 and Stat 244, Ps y 321, plus 12 upperdivis ion credits in psychology.
Also offered for graduate-level credit as Psy 598 and may be taken only once for credit. .
Psy 501 - Research (0-9)
(Credit to be arranged.) Consent of instructor.

## Psy 502 - Independent Study (1-9)

(Credit to be arranged.)

## Psy 503 - Thesis (0-9)

(Credit to be arranged.)

## Psy 504 - Cooperative Education/Internship (0-9)

(Credit to be arranged.)

## Psy 505 - Reading and Conference (0-9)

(Credit to be arranged.) Consent of instructor.

## Psy 506 -Projects (1-9)

(Credit to be arranged.)

## Psy 507 -Seminar (1-6)

(Credit to be arranged.) Consent of instructor.

## Psy 509 - Practicum (0-9)

(Credit to be arranged.) Supervised psychological practice including observing, studying, and participating in the activities of private settings or community service agencies such as: schools, mental health clinics, correctional agencies, and day care centers. Supervision may include guided reading, daily journals, and evaluativereports.

## Psy 510 -Selected Topics (1-6)

(Credit to be arranged.)

## Psy 511 - Advanced Community Psychology (4)

Theory, methods, practice, and selected topics in advanced community psychology.

Also offered as Psy 611 and may be taken only once for credit.

## Psy 513 - Ecops ychology (4)

Course explores a range of topics reg arding the humannature relationship, including humans as an inseparable from nature, influences of built and natural environments on mind and behavior, psychological theory and strategies for addressing en vironmental problems, evolutionary and cultural factors, and the use of nature in therapy.
Discussions, lecturettes, experiential, guest-speakers.
Also offered for undergraduate-level credit as Psy 413 and may be taken only once for credit. Prerequisite: Psy 200, Psy 204, and Psy 321.
Psy 514 - Advanced Applied Social Psychology (4)
Theory, methods, and selected topics in advanced applied socialpsychology.

Also offered as Psy 614 and may be taken only once for credit.

## Psy 515 - Advanced Applied Developmental Psychology

 (4)Theory, methods, and selected topics in advanced applied developmental psychology.

Also offered as Psy 615 and may be taken only once for credit.

## Psy 516 - Advanced Organizational Psychology (4)

Theory, methods, and selected topics in organizational psychology including leadership, motivation, job attitudes, job stress, organizational climate, and employee retention.
Also offered as Psy 616 and may be taken only once for credit.

## Psy 517 - Advanced Industrial Psychology (4)

Theory, methods, and selected topics in industrial psychology including job analysis, performance appraisal, personnel selection, legal issues, and training. Expected preparation: admis sion to Ps ychology graduate program.
Also offered as Psy 617 and may be taken only once for credit. .

## Psy 518 - Ethics and Professional Issues in Applied Research and Practice (4)

Examines ethical is sues of importance to applied psychologists with special attention to the use of human subjects in psychological research. Addresses ethical issues in professional relationships and in the teaching of psychology.

Also offered as Psy 618 and may be taken only once for credit.

## Psy 519 -Field Experimental Methods (4)

Problems of designing an experimental investigation of psychological phenomenain a naturalistic field setting. Course requirements include the design of a realis tic research proposal. Extensive use is made of instructor experience with field experimental studies in the field of mentalhealth.
Prerequisite: graduates tatus in psychology or urban studies.

## Psy 520 - Methods of Psychological Assessment (4)

Formulation of problems that can be answered by tests. Reliability, validity, and standardization of measurement, test fairness; methods of identifying assessment tools (tests, etc.) appropriate to specific testing or assessment problems are also considered.
Prerequisite: Stat 243.

## Psy 521 - Univariate Quantitative Methods (5)

Survey of topics in univariate quantitative methods, including: graphical displays, descriptive statistics, statistical inference, group comparisons, analysis of variance for between group and factorial des igns, correlation, regression, and analysis of association for categorical variables.

Also offered as Psy 621 and may be taken only once for credit.

## Psy 522 - Multiple Regression and Multivariate Quantitative Methods (5)

Exploration of statistical methods with several variables, including: simultaneous and hierarchical regression, discriminant analysis, multiv ariate analy sis of variance, analys is of covariance, and logistic regression. SPSS will be used for conducting analyses and students will gain experience in writing journal quality results and discussion sections.
Also offered as Psy 622 and may be taken only once for credit.

## Psy 523 - Structural Equation Modeling (4)

Introduction to path analysis, confirmatory factor analysis, and structuralequation modeling, topics include exploratory and confirmatory factor analysis, model fitting concepts, mediation, analysis of nonnormal and categorical data, and longitudinal models.
Also offered as Psy 623 and may be taken only once for credit.

## Psy 524 - Res earch Design in Applied Ps ychology (4)

Process of exploring how key social/community, org anizational, and developmental concepts shape the conceptualization and design of research in applied psychology. Students conceptualize and construct three alternative study designs employing the relevant concepts. Explore basic design is sues such as control, causation, confounding, contrasts, and threats to validity; measurement; and the use of key concepts such as organizational context, social interactions, dynamics, levels of analysis, and systems in ps ychologicaltheory and research.

Also offered as Psy 624 and may be taken only once for credit.

## Psy 525 - Categorical Data Analysis (4)

Introduction to categorical data analyses. Topics include: review of discrete probability distributions and descriptive statistics, simple proportions and chi-square, contingency table analyses, matched pairs analy ses, loglinear models, logistic and probit regression models, propensity scores, ordinal and multinomial logistic regression, generalized linear models, and categorical measurement issues.

Also offered as Psy 625. Prerequis ite: Students should have at least one graduate statistics course covering chisquare, ANOVA, and regression analy sis, such as Ps y 521/Psy 621 and Psy 522/Psy 622.

## Psy 526 - Multilevel Regression (4)

Multilevel regression models can be used to analyze hierarchically structured data, such as educational studies, and longitudinal data. Material is presented with an applied researcher's perspective in mind, covering fundamental
concepts, basic mathematical and statistical underpinnings, and illustrations using computer software. Topics include: randomcoefficients, interclass correlation coefficient, explained variance, cross-level interactions, centering, model ass umptions and diagnostics, binary and ordinal outcomes, and growth curve models. This course assumes prior knowledge about multiple regression analysis.
Prerequisite: Prerequisites: Psy 521/Psy 621 and Psy 522/Psy 622 or equivalent approved by ins tructor.

## Psy 527 -History and Systems of Psychology (4)

A survey of the history of ps ychology and of past and current theoretical approaches in psychology. Study of the historical roots of current theories in perception, learning, motivation, personality and other fields.

Also offered for undergraduate-level credit as Psy 427 and may be taken only once for credit. .

## Psy 528 -Seminar in Applied Developmental Psychology (4)

Theory and research in selected topics in applied developmental psychology.
Also offered as Psy 628 and may be taken only once for credit.

## Psy 529 - Psychological Issues in Later Life (4)

Methodological, theoretical and empirical is sues in research on psychology and aging. Topics include cognitive processes, family and caregiving relationships, environmental issues and psychological predictors of successful aging. Emphas is is on encouraging students to develop their own research project in the field of psychology of aging.
Prerequisite: admission to a graduate programor Graduate Certificate in Gerontology program.

## Psy 530 - Applied Social Psychology (4)

Explores current and potential applications of social psychological theories and research methods, with a focus on work conducted in field settings. As a final project, each studentexamines an applied area of their own choosing (previous projects have focused on normative role transitions, responses to natural dis asters, political attitudes, conflict resolution, and intergroup relations).
Also offered for undergraduate-levelcredit as Psy 430 and may be taken only once for credit.

## Psy 532 - Clinical Interviewing (4)

Introduction to principles and techniques of interviewing. Focus on clinical applications in organizational settings.

## Psy 533 - Contemporary Social Psychology (4)

Current knowledge of social ps ychology presented with an emphas is on what the field can contribute to understanding contemporary social problems and is sues. Major topics will include the nature of social interaction, the relationship of attitude and behavior, and group processes. Areas of application will include social helping networks and the relationships of social psychology to law, health, and the environment.
Prerequisite: admis sion to a graduate programin psychology, systems science, or urban affairs.
Psy 534 - Introduction to Psychopathology (4)
Course content will survey the development of modern ideas of mentalillness, the origins of mentalillnesses, the diagnostic systemand the clinical syndromes, and methods of treatment of neuropsychiatric disorder. This course does not produce diagnosticians of mental illness but is a preparation for the clinical study of diagnosis.
Also offered for undergraduate-level credit as Psy 434 and may be taken only once for credit. .
Psy 535 - Ps ychological Consulting in Organizations (4)
Psychologically-based theories and techniques aimed at the planned changeof organizational work setting for the purpose of enhancing individual developmentand improving organizational performance. Issues in consultant-clientrelationships, specific change methods, and systemramifications of guided change using the action research model are integrated throughout the course.

## Psy 536 - Performance Appraisal and Feedback (4)

Applications of psychological concepts to the development of performance appraisal systems in organizations. Topics include job analysis, cognitive processes in performance apprais al, types of rating scales, rater training methods, technical as pects of developing a performance appraisal system, performancefeedback, individuals' reactions to performance feedback factors related to the perceived accuracy of performance feedback. Recommended prerequisites: Stat 243 and 244, Psy 321 and 360 or 361.

## Psy 537 - Qualitative Research Methods for Social Inquiry (4)

Introduction to qualitative research methods in psychology. Covers epistemology, res earch design, data collection techniques, narrative analysis, computer-aided analysis of text, qualitative research ethics, and writing/reporting of research. Includes field research project in the community.
Also offered as Psy 637 and may be taken only once for credit.

## Psy 540 - Group Process (4)

A course on the psychology of small groups. Topics will include but notbe limited to: interpers onal attraction, stages of group development, group structure, coalition formation, pers onal power, leadership, group decision making and problemsolving, intergroup relations and the principles of negotiation. Expected preparation: graduate standing or consent of ins tructor.
Also offered for undergraduate-levelcredit as Psy 440 and may be taken only once for credit. .

## Psy 544 -Job Anal ysis (4)

Methods (e.g., interviews, surveys) used to collect information about jobs for use in human res ource functions such as personnel recruitment and selection, training, performance appraisal, and compensation. Such information is also used to developjob descriptions and specifications. Course contains a community-based learning component. Students participate in a full job analys is including data collection, analysis, and interpretation.
Also offered for undergraduate-level credit as Psy 444 and may be taken only once for credit. .

## Psy 545 -Employee Development (4)

Covers the application of psychological principles to employee training and development. Topics include organization, job, and person analysis; programdesign; the application of learning principles to enhance training effectiveness; evaluation of training programs; and employee training and development methodology. A heavy emphasis is placed on current psychological research. This course may include a community-based learning component.

Also offered for undergraduate-levelcredit as Psy 445 and may be taken only once for credit. .

## Psy 546 -Personnel Selection (4)

Technicaland theoretical issues involved in selecting the appropriate worker to fit a job. Includes current research and theory in test development, test validation, selection methods, and criterion development. Heavy emphasis on psychological measurement (e.g., reliability and validity) and the legal issues involved in hiring and promoting employees.
Also offered as Psy 646 and may be taken only once for credit. . Prerequisite: admission to the psychology graduate program.

## Psy 547 -Pers onnel Psychology (4)

How individual differences affect work behavior and task performance and how psychologists meas ure and predict such differences. Covers the development, adminis tration, and utility of modern ins truments for selection and
apprais al. Data combination strategies and decision making in personnel systems are discussed.

Also offered for undergraduate-level credit as Psy 447 and may be taken only once for credit. .

## Psy 548 - Ps ychology of Work Motivation (4)

Examination of the role that motivation plays in initiating, guiding, and maintaining work behaviors. Discussion of job attitudes, emotional intelligence, personality factors, socialization and culture, effects of participation, careers, job enrichment, re-en gineering, and power and politics.

Also offered for undergraduate-level credit as Psy 448 and may be taken only once for credit. .

## Psy 550 - Occupational Health Psychology (4)

Application of professional psychological principles of practice, theory, and research to work settings. Focus on science and practice drawn fromps ychology and other disciplines in the promotion and development of workplace health-and safety-related initiatives. Occupational Health Psychology researchers and practitioners draw from the domains of public health, preventive medicine, nursing, industrial engineering, law, epidemiology, and psychology to develop sound theory and practice for protecting and promoting the safety, health, and wellbeing of individuals in occupational settings.
Also offered as Psy 650 and may be taken only once for credit.

## Psy 551 - Introduction to Neurophysiological Psychology (4)

The study of the nervous system, various anatomical, neurophysiological, and imaging techniques forstudying the brain and behavior, including specific cognitive abilities such as sensation, perception, attention, language, and emotion.
Also offered for undergraduate-level credit as Psy 451 and may be taken only once for credit. .

## Psy 554 -Social Psychology of Mental Health (4)

Principles of experimentaldesign, evaluation of research methods, formulation and testing of hypotheses using research procedures, use of statistical software for analyzing the research data, writing a research manuscript using APA form.
Also offered as Psy 654 and may be taken only once for credit. .

## Psy 559 - Infant Development (4)

Development of the individual fromconception to age two. Theory and research pertaining to infant development.

## Psy 560 - Child Psychology (4)

Development of the individual fromconception through childhood. Theory and research pertaining to child development.
Also offered for undergraduate-levelcredit as Psy 460 and may be taken only once for credit. .

## Psy 561 -Psychology of Adolescence and Early

 Maturity (4)Development of the individual frompuberty to early adulthood. Theory and research pertaining to adolescent development.

## Psy 562 -Psychology of Adult Development and Aging (4)

Development of the individual fromearly adulthood through old age. Theory and research focusing on adult development froma life-span perspective.
Also offered for undergraduate-levelcredit as Psy 462 and may be taken only once for credit. .

## Psy 564 -Developmental Psychopathology (4)

Study of the origins and course of individual patterns of behavioral adaptation and maladaption. Application of developmental principles to an understanding of social, emotional, and conduct disorders of children and their outcome in adult life.

Also offered for undergraduate-level credit as Psy 464 and may be taken only once for credit. .

## Psy 565 - Applied Developmental Psychology (4)

Theory, methods, and research in selected areas of applied developmental psychology.
Also offered for undergraduate-levelcredit as Psy 465 and may be taken only once for credit.

## Psy 566 - Research in Applied Developmental

 Psychology (4)Conducted in collaboration with an approved faculty research mentor. Research areas may include prosocial, social, cognitive, and motivational development, attachment, peer groups, parenting, teaching, early literacy, identity, aging, coping, self-s ystemprocesses, and the social and cross-cultural contexts of development, including the family, schools, and day care. Involves data gathering, analysis, and/or reporting results of research conducted in a field setting. Emphas is on applied is sues related to research design, data collection, data analy sis, and scientific writing.

Also offered as Psy 666 and may be taken only once for credit.

## Psy 567 - Work and Family (4)

An examination of the effects of work on family, and family on work, in contemporary society. Includes study of dual-career and dual-work families, effects of maternal employment on children, impact of child care and elder care on the workplace, and parental leave and other workplace supports for families. Implications of research for social policy.
Also offered for undergraduate-level credit as Psy 467 and may be taken only once for credit. .

## Psy 568 -Social Development (4)

Development of individual's social relationships from infancy to adolescence. Theory and research pertaining to social development froman interactional perspective.

Also offered for undergraduate-level credit as Psy 468 and may be taken only once for credit. .

## Psy 569 - Res earch in Applied Social/Community Psychology (4)

Conducted in collaboration with an approved faculty research mentor. Research areas may include social relationships and health behaviors; social relationships and subjective well-being; community-based interventions; self-help groups; social psychological perspectives on socialmovements; gender issues; family violence; and prevention. Involves data gathering, analysis, and/or reporting results of research conducted in a field setting. Emphasis on applied issues related to research design, data collection, data analysis, and scientific writing.

Also offered as Psy 669 and may be taken only once for credit.

## Psy 571 - Health Psychology (4)

Study of the social and psychological influences on how people stay well, why some people become ill, and how persons res pond to illness. Particular attention to the stress process
Also offered for undergraduate-level credit as Psy 471 and may be taken only once for credit. .

## Psy 578 - Leadership and Group Effectiveness (4)

Study of leadership in s mall groups with an emphasis on interpersonal influence processes. Leadership is viewed as statements or actions intended to influence a group's efforts toward goal setting and achievement. Includes discussion of leadership training/development, and self-awareness of style.

Also offered for undergraduate-level credit as Psy 478 and may be taken only once for credit. .

## Psy 580 -Community Psychology: Empowerment, Action, and Social Change (4)

Community Psychology seeks to understand the relation ship between individual well-being and diverse environmental influences, fromfamilies and neighborhoods to culture and mass media. In this course, students will learn major theories and concepts in the field, apply themto pressing social is sues, evaluate their implications for research, practice, and policy.
Also offered for undergraduate-level credit as Psy 480 and may be taken only once for credit.

## Psy 584 -Principles of Behavior Modification (4)

A survey of recent developments in the application of behavior theory to problems of psychological adjustment. The course includes treatment of the behavioral concept of "abnormal", and the development of a technology of behavior therapy. The course is intended for advanced students in ps ychology, social work, specialeducation, speech pathology, and nursing.

Also offered for undergraduate-levelcredit as Psy 484 and may be taken only once for credit. .

## Psy 585 -Self-modification of Behavior (4)

The technology of self-change developed within the framework of behavior modification theory, including relevant ethical and theoretical is sue 4 s , specific techniques of change and the application of these techniques within a systematic programdevelopment model.
Also offered for undergraduate-levelcredit as Psy 485 and may be taken only once for credit. .

## Psy 586 -Social ProgramEvaluation (4)

Foundational concepts in social programevaluation theory and practice including theoretical pers pectives on the nature and purposeof programevaluation, phases of programevaluation, ethics and standards of practice, sociopoliticalconsiderations, and proposal and report writing. Expected preparation: Psy 521, Psy 522, Psy 524.
Also offered as Psy 686 and may be taken only once for credit. .

## Psy 587 -Life-span Development (4)

Theories and methodology for the study of processes and change in life-span developmental perspective. Practical implications of different perspectives for theories and research regarding human development.
Also offered for undergraduate-level credit as Psy 487 and may be taken only once for credit. .

## Psy 589 - Adult Socialization (4)

This course examines the acquisition of social roles in adulthood. Two themes prevail: stages of socialization; and
levels of transmission of social norms (cultural, org anizational, and interpersonal).
Also offered as Psy 689 and may be taken only once for credit. Prerequisite: graduate status. .

## Psy 591 - Decision Making I: Values and Choice (4)

Normative models, des criptive models, and cognitive aids for structuring decision problems, evaluating consequences of alternative courses of action, and choosing among alternatives.

Prerequisite: Stat 243 and 244, Psy 321 and 348; or permis $s$ ion of instructor.

## Psy 592 - Decision Making II: Judgement and Reason

 (4)Normative and descriptive models for structuring decis ion problems, evaluating consequences of alternativecourses of action, thinking about probability and causation, and choosing among alternatives. Recommended prerequisites: Stat 243 and 244, Psy 321 and 348.

## Psy 593-Decision Making Laboratory (4)

Practice in the use of judgmenttechniques and decision software to structure decision problems, evaluate alternative courses of action, perform sensitivity analyses, and prepare presentations. Wherever possible, practice will be on current decision problems in field settings. Expected preparation: Psy 591, Psy 592.
Also offered for undergraduate-level credit as Psy 493 and may be taken only once for credit. .

## Psy 594-Mathematical Models in Psychology (4)

Introduction to the use of probability theory and elementary functions in models for psychological processes: applications include decis ion analysis, psychophysics, and descriptive and theoretical applications of Markov chains in the study of learning and interpersonal interactions.

## Psy 595 -Psychological Measurement (4)

Theories, methods, and implications in the development and validation of measures of psychological constructs. Students will learn about the issues of reliability, validity, item analys is, standardization, and applications of measures via both lectures and hands-on experiences in the lab. Expected preparation: PSY521 or equivalent statistics/method courses.

Also offered as Psy 695 and may be taken only once for credit. .

## Psy 597 - Applied Survey Research (4)

Provides theoretical framework for and experience in design, execution, and interpretation of social surveys including sampling procedures, questionnaire design, interviewing techniques, coding and computer analysis, and report writing.

Also offered for undergraduate-levelcredit as Psy 497 and may be taken only once for credit. .

## Psy 598 -Field Obs ervation Methods

Applied experience in the major methodological techniques offield observation, as well as the key problems of validity and reliability as they arise while developing a behavioralobservation system.
Also offered for undergraduate-level credit as Psy 498 and may be taken only once for credit. .

## Psy 601 - Research (1-12)

(Credit to be arranged.) Consent of instructor.

## Psy 602 - Independent Study (1-9)

(Credit to be arranged.)

## Psy 603 -Dissertation (1-12)

(Credit to be arranged.)

## Psy 604 - Internship(1-9)

(Credit to be arranged.)

## Psy 605 - Reading and Conference (1-6)

(Credit to be arranged.) Consent of instructor.

## Psy 606 - Projects (1-9)

(Credit to be arranged.)

## Psy 607 -Seminar (1-6)

(Credit to be arranged.) Consent of instructor.

## Psy 608 -Workshop(1-9)

(Credit to be arranged.)

## Psy 609 - Practicum(1-9)

(Credit to be arranged.)

## Psy 610 -Selected Topics (1-6)

(Credit to be arranged.)

## Psy 611 - Advanced Community Psychology (4)

Theory, methods, practice, and selected topics in advanced community psychology.
Also offered as Psy 511 and may be taken only once for credit.

## Psy 614 - Advanced Applied Social Psychology (4)

Theory, methods, and selected topics in advanced applied socialpsychology.
Also offered as Psy 514 and may be taken only once for credit.

## Psy 615 - Advanced Applied Developmental Psychology (4)

Theory, methods, and selected topics in advanced applied developmental psychology.
Also offered as Psy 515 and may be taken only once for credit.

## Psy 616 - Advanced Organizational Psychology (4)

Theory, methods, and selected topics in organizational psychology including leadership, motivation, job attitudes, job stress, organizational climate, and employee retention.
Also offered as Psy 516 and may be taken only once for credit.

## Psy 617 - Advanced Industrial Psychology (4)

Theory, methods, and selected topics in industrial psychology including job analysis, performance appraisal, pers onnel selection, legalissues, and training. Expected preparation: admission to Psychology graduate program.
Also offered as Psy 517 and may be taken only once for credit. .

## Psy 618 - Ethics and Professional Issues in Applied Research and Practice (4)

Examines ethical is sues of importance to applied psychologists with special attention to the useof human subjects in psychological research. Addresses ethical issues in professional relationships and in the teaching of psychology.
Also offered as Psy 518 and may be taken only once for credit.

## Psy 621 - Univariate Quantitative Methods (5)

Survey of topics in univariate quantitative methods, including: graphical displays, descriptive statistics, statistical inference, group comparisons, analysis of variance for between group and factorial designs, correlation, regression, and analysis of association for categorical variables.
Also offered as Psy 521 and may be taken only once for credit.

## Psy 622 -Multiple Regression and Multivariate Quantitative Methods (5)

Exploration of statistical methods with several variables, including: simultaneous and hierarchical regression, discriminant analysis, multivariate analysis of variance, analys is of covariance, and logistic regression. SPSS will be used for conducting analyses and students will gain experience in writing journal quality results and discussion sections.

Also offered as Psy 522 and may be taken only once for credit.

## Psy 623 -Structural Equation Modeling (4)

Introduction to path analysis, confirmatory factor analy sis, and structural equation modeling, topics include exploratory and confirmatory factor analysis, model fitting concepts, mediation, analysis of nonnormal and categorical data, and longitudinal models.
Also offered as Psy 523 and may be taken only once for credit.

## Psy 624 - Research Design in Applied Psychology (4)

Process of exploring how key social/community, organizational, and developmental concepts shape the conceptualization and design of research in applied psychology. Students conceptualize and construct three alternative study designs employing the relevant concepts. Explore basic design is sues such as control, causation, confounding, contrasts, and threats to validity; measurement; and the use of key concepts such as org anizational context, social interactions, dynamics, levels of analysis, and systems in psychological theory and research.

Also offered as Psy 524 and may be taken only once for credit.

## Psy 625 - Categorical Data Analysis (4)

Introduction to categorical data analyses. Topics include: review of discrete probability distributions and descriptive statistics, simple proportions and chi-square, contingency table analyses, matched pairs analyses, loglinear models, logistic and probit regression models, propensity scores, ordinal and multinomial logistic regression, generalized linear models, and categorical measurement is sues.

Also offered as Psy 525. Prerequisite: Students should have at least one graduate statistics course covering chisquare, ANOVA, and regression analy sis, such as Psy 521/Psy 621 and Psy 522/Psy 622.

## Psy 626 - Multilevel Regression (4)

Multilevel regression models can be used to analyze hierarchically structured data, such as educational studies, and longitudinal data. Material is presented with an applied researcher's perspective in mind, covering fundamental concepts, basic mathematical and statistical underpinnings, and illus trations using computer software. Topics include: randomcoefficients, interclass correlation coefficient, explained variance, cross-level interactions, centering, model assumptions and diagnostics, binary and ordinal outcomes, and growth curve models. This course assumes prior knowled ge about multiple regression analy sis.
Prerequisite: Prerequisites: Psy 521/Psy 621 and Psy 522/Psy 622 or equivalent approved by instructor.

## Psy 628 - Seminar in Applied Developmental Psychology (4)

Theory and research in selected topics in applied developmental psychology.
Also offered as Psy 528 and may be taken only once for credit.

## Psy 629 - Ps ychological Issues in Later Life (4)

Methodological, theoretical and empirical issues in research on psychology and aging. Topics include cognitive processes, family and caregiving relationships, environmental issues and psychological predictors of successful aging. Emph as is is on encouraging students to develop their own research project in the field of psychology of aging.

Prerequis ite: admis sion to a graduate programor Graduate Certificate in Gerontology program.
Psy 632 - Clinical Interviewing (4)
Introduction to principles and techniques of interviewing. Focus on clinical applications in organizational settings.

## Psy 633 - Contemporary Social Psychology (4)

Current knowledgeof social ps ychology presented with an emphas is on what the field can contribute to understanding contemporary social problems and is sues. Major topics will include the nature of social interaction, the relationship of attitude and behavior, and group processes. Areas of application will include social helping networks and the relationships of social psychology to law, health, and the environment.

Prerequisite: admis sion to a graduate programin psychology, systems science, or urban affairs.

## Psy 635 -Psychological Consulting in Organizations (4)

Ps ychologically-based theories and techniques aimed at the planned change of organizational work setting for the purpose of enhancing individual development and improving org anizational performance. Issues in consultant-client relationships, specific change methods, and systemramifications of guided change using the action research model are integrated throughout the course.

## Psy 637 -Qualitative Research Methods for Social Inquiry (4)

Introduction to qualitative research methods in the social sciences. The coursereviews epistemologies informing qualitative research. The course also explores commonly used methods including field notes, interviews, focus groups, case studies, observational methods, and openended surveys. Introduction to various analysis and writing strategies will be explored. This is the same course as SW 637 and may be taken only once for credit.

Also offered as Psy 537 and may be taken only once for credit. Cross-Listed as:SW 637.

## Psy 646 -Personnel Selection (4)

Technicaland theoretical issues involved in selecting the appropriate worker to fit a job. Includes current research and theory in test development, test validation, selection methods, and criterion development. Heavy emphasis on psychological meas urement (e.g., reliability and validity) and the legal is sues involved in hiring and promoting employees.
Also offered as Psy 546 and may be taken only once for credit. . Prerequisite: admission to the psychology graduate program.

## Psy 650 - Occupational Health Psychology (4)

Application of professional psychological principles of practice, theory, and research to work settings. Focus on science and practice drawn frompsy chology and other disciplines in the promotion and development of workplace health- and safety-related initiatives. Occupational Health Ps ychology researchers and practitioners draw from the domains of public health, preventive medicine, nursing, indus trial engineering, law, epidemiology, and psychology to develop sound theory and practice for protecting and promoting the safety, health, and well being of individuals in occupational settings.
Also offered as Psy 550 and may be taken only once for credit.

## Psy 654 -Social Psychology of Mental Health (4)

Principles of experimental design, evaluation of research methods, formulation and testing of hypotheses using research procedures, use of statistical software for
analyzing the research data, writing a research manuscript using APA form.
Also offered as Psy 554 and may be taken only once for credit. .

## Psy 666 - Research in Applied Developmental Psychology (4)

Conducted in collaboration with an approved faculty research mentor. Research areas may include prosocial, social, cognitive, and motivational development, attachment, peer groups, parenting, teaching, early literacy, identity, aging, coping, self-systemprocesses, and the social and cross-cultural contexts of development, including the family, schools, and day care. Involves data gathering, analysis, and/or reporting results of research conducted in a field setting. Emphasis on applied is sues related to research design, data collection, data analy sis, and scientific writing.
Also offered as Psy 566 and may be taken only once for credit.

## Psy 669 - Res earch in Applied Social/Community Psychology (4)

Conducted in collaboration with an approved faculty research mentor. Research areas may include social relationships and health behaviors; social relationships and subjective well-being; community-based interventions; self-help groups; social ps ychological perspectives on social movements; gender is sues; family violence; and prevention. Involves data gathering, analysis, and/or reporting results of res earch conducted in a field setting. Emphasis on applied issues related to research design, data collection, data analysis, and scientific writing.

Also offered as Psy 569 and may be taken only once for credit.

## Psy 686 -Social ProgramEvaluation (4)

Foundational concepts in social programevaluation theory and practice including theoretical perspectives on the nature and purposeof programevaluation, phases of programevaluation, ethics and standards of practice, sociopolitical considerations, and proposal and report writing. Expected preparation: Psy 621,Psy 622, Psy 624.
Also offered as Psy 586 and may be taken only once for credit. .

## Psy 689 - Adult Socialization (4)

This course examines the acquisition of social roles in adulthood. Two themes prevail: stages of socialization; and levels of transmission of social norms (cultural, organizational, and interpersonal).
Also offered as Psy 589 and maybe taken only once for credit. Prerequisite: graduate status. .

## Psy 695 -Psychological Measurement (4)

Theories, methods, and implications in the development and validation of measures of psychological constructs. Students will learn about the issues of reliability, validity, item analys is, standardization, and applications of measures via both lectures and hands-on experiences in the lab. Expected preparation: Ps y 621 or equivalent statistics/method courses.
Also offered as Psy 595 and may be taken only once for credit. .

## READ - READOregon

## READ 509 - Practicum: ReadOregon (1-3)

The practicumis carried out in schools and/or districts and consists of reading endorsement candidates working directly with students, other faculty, adminis trators, and the school community to fulfill various roles of the reading specialist. Among the roles to be demonstrated during the practicumare: (1) teaching reading; (2) literacy testing; (3) developing curriculumfor various groups of readers including ELL, struggling, readers, average and/or gifted readers; (4) assessing and making recommendations for a school's reading program; and (5) developing literacyfocused professional development sessions for faculty, administrators, instructional assistances, and parents.
Prerequisite: The practicummay not be taken untila candidate has completed a minimum of 12 credit hours of coursework in literacy. Typically, the practicumis the final caps tone course of the reading endorsement course of study.

## READ 518 - Language and Literacy Development, K-8

 (3)Examine the connection between early childhood oral language acquisition and the development of reading and writing skills, Discuss relevant language and literacy research, differences in language and literacy development, foundations of language development in the brain and its implication as regards phonological skills, grammatical knowledge, vocabulary, comprehension, and writing.

## READ 519 -Linguistics, Phonics, and Word-Level Reading Difficulties (3)

Addresses phonetics, phonological awareness, phonics, word identification, and spelling. Explores developmental trajectories, instructional strategies, and assessment tools through culturally responsive and culturally sustaining pedagogical lenses. Includes characteristics as sociated with dyslexia, tools used to screen for such characteristics, ins tructional strategies designed to benefit students with these characteristics, and related laws/policies. Field-based work with K-12 reader exhibiting characteristics of
dyslexia and with K-12 school to examine curriculumand interview teachers.

## READ 522 -Literacy Foundations (3)

Focuses on the foundational areas of psychology, history, theory, and research, and familiarizes teachers and reading specialists with varied ideas about how reading and writing work and how they are learned, through the examination of major theorists and researchers, both present and past.

## READ 527 - Literature in Classrooms K-12 (3)

This course focuses on the exploration of literature for students in grades K-12, and the application of literature in the clas sroom. Emphas is is on selection and evaluation of books, children's reading interests, clas sroomapplications and school leadership in promoting literature in clas sroom and school settings.

## READ 530 - Reading and Composition in the Content Areas (3)

Designed for pre-service and in-service teachers to explore literacy strategies in order to guide their students in acquiring skills needed for adequate reading, writing, and study in content areas. Emphasis is on the functional teaching of reading and writing including designing and preparing materials to use with curriculummaterials in all school subjects. Designed also to help educators identify and design materials to promote and develop Oregon's Standard and Benchmark literacy abilities in their students.

## READ 531 - Teaching the Struggling Adolescent Reader (3)

For middle and high school teachers who want to experience hands-on teaching and learning strategies for improving motivation and learning in the core subject areas. As part of a collaborative effort, teachers will work with each other to develop tutoring plans and activities in curriculummaterials to be used in teaching struggling readers in their own clas sroom. Recommended prerequisites: enrollment in ReadOregon Reading Endorsement programor COE Literacy or master's program.

## READ 532 - Writing ProgramDesign and Implementation in K-12 Classrooms (3)

This course explores the design and implementation of writing curricula in both literacy and content-based clas srooms. The course provides a comprehensive approach to the development of a writing clas sroom,
including the designing writing strategies and assessment. In addition, the course explores the roles of inquiry, inclusion, and collaboration in the teaching of writing. The focus is on creating writing instruction and assessment that is authentic, engaging and aligned to the instructional needs of students.

## READ 533 - Boy Readers/Boy Writers (3)

Critically analyze and implement research-based practices in reading and writing as they relate to boys' learning style. Demons trate appropriate professional knowledge, skills and dis positions through reading criticaltheory in instructional strategies that benefit boy's needs. Use evidence to solve problems of practice and make educational decisions.

## READ 534 -Literacy Assessment (3)

Examines purposes for and types of literacy as sessment; how culture and language intersect with as sessment. Addresses selection of specific assessments to guide instruction, us ing assessments to inform various stakeholders, evaluation of validity and reliability, as sessment bias, stereotype threat, advocating for equity and as set-based practices with colleagues, schoolwide as sessment plans, and analysis of current practices. Fieldbased work with K-12 school: participate in data analysis meeting, interview teachers, examine a literacy assessment tool and student assessment data.

## READ 540 - Media Literacy: K-12 (1)

This course is concerned with helping $\mathrm{K}-12$ teachers develop an informed and critical understanding of the nature of mass media, so that they can teach children how to build connections between their learning in the clas sroomand their use of media outside of school. Participants will develop abilities to access, analyze, evaluate, and communicate information in a variety of formats.

## READ 544-Comprehension, Text Structure, and Vocabulary (3)

Addresses learning, teaching, and assessing reading comprehension and vocabulary. Emphas is on culturally responsive and culturally sustaining instruction, students who are emergent multilinguals, and students experiencing difficulty with comprehension or vocabulary. Topics include developmental trajectories, morphology, historical instructional approaches, strategic reading, cultural variations in text structure, curricular analysis, digital tools, digital citizenship, and visual literacy. Field-based
work with K-12 reader experiencing difficulty with comprehension or vocabulary.

## READ 551 -Literacy Instruction for Special Needs Students K-12 (3)

Designed to prepare effective and reflective teachers in language and literacy instruction for students with special needs. Participants will explore multiple perspectives, practices, and methodological approaches to literacy instruction which are research-based, and proven effective to promote literacy development. Topics include (but are not limited to): (1) language and literacy development; (2) characteristics of specialneeds students; (3) framework of effective literacy instruction within context of students with specialneeds; (4) methods of effective basic literacy skills instruction; (5) methods of teaching comprehension and critical thinking strategies; (6) methods of promoting learning and meta-cognitive strategies for lifelong learning, and (7) methods of appropriate and meaningful assessment.

## READ 554 -Literacy Instruction Strategies with ELL Students, K-12 (3)

Focuses on research-based effective literacy instruction frameworks and strategies for working with English language learners. Emphasis is placed on frameworks and strategies that promote ELL's academic and English literacy development in an authentic and culturally responsive environment.

## READ 571 - Principles/Methods of Diagnosis and Assessment K-12 (3)

Literacy theory (review/overview of the psychological, sociological, and linguistic foundations of reading processes and instruction, including developmental stages of literacy). Ps ychometrics (the science of meas urement in the social sciences). Measures of reading proficiency and reading achievement (with specific examples of standardized reading measures and discrete-point reading proficiency measures). Authentic literacy assessment (with specific examples of authentic reading as sessment tasks). Literacy assessment and students with special needs (English language learners, students with learning disabilities, talented and gifted students). Test ethics and how assessment results are used (including communication with various stakeholders). Recommended prerequisites: enrollment in ReadOregon Reading Endorsement program or COE Literacy or master's program.

## READ 580 - School Reading ProgramLeadership (3)

Designed for pre-service and practicing educators who are applying for a reading endorsement or MEd with a reading emphasis, as well as others interested in school leadership. Emphas is is on the functional planning, org anization, and management of classroomand school-wide reading programs. Recommended prerequisites: Enrollment in ReadOregon Reading Endorsement programor COE Literacy or master's program.

## READ 582 - Reading Leadership in Middle and High

 Schools (3)Designed for adminis trators and teachers in leadership roles in middle and high schools. Explores ways to improve reading achievement in schools by identifying the school's existing strengths, apply current research and practice, and creating an action plan. Recommended prerequisites: enrollment in ReadOregon Reading Endorsement programor COE Literacy or master's program.

## RE - Real Estate

RE 199 - Special Studies (1-8)
(Credit to be arranged.)

## RE 360 - Real Estate Finance I (4)

Application of finance and economic principles to analysis of realestate finance and investments. Emphasis on the development of problem solving capabilities through the use of computer application programs. Special attention is given to risk analys is, alternative mortgageinstruments, hedging techniques, and the taxeffects of real estate investment.

Prerequisite: Ec 201. This course is cross listed as USP 360 and may only be taken once for credit.

## RE 399 - Special Studies (1-8)

(Credit to be arranged.)

## RE 401 - Research (1-12)

(Credit to be arranged.)

## RE 404 - Cooperative Education/Internship (1-12)

(Credit to be arranged.)

## RE 405 - Reading and Conference (1-8)

(Credit to be arranged.)

## RE 407 - Seminar (1-8)

(Credit to be arranged.)

## RE 409 - Practicum(1-8)

(Credit to be arranged.)

## RE 410 - SelectedStudies (1-8)

(Credit to be arranged.)

## RE 431 - Urban Economics (4)

Functions of the urban economy: the market sector and the public sector. Economic analysis of is sues such as land use, environmental quality, transportation, housing, income distribution, and the organization and financing of urban public services. This course is the same as Ec 431 and USP 431 and may only be taken once forcredit.

Prerequisite: Ec 201, Ec 202 and junior standing. CrossListed as: Ec 431 and USP 431.

## RE 438 - Real Estate Law I (3)

Provides students with a comprehensive summary of real property froma legal perspective with an emphasis on trans actional is sues. Includes is sues relating to types of ownership, descriptions of property, easements, public and private limitations on use, real estate contracts, forms utilized in transfers, financing and title as surances. The class will enable students to understand the legal framework and the rights and responsibilities of owners and transferors/transferees of real property. This is the same course as USP 438 and may be taken only once for credit.
Also offered for graduate-level credit as RE538S and may be taken only once for credit. . Prerequisite: Ec 201. Cross Listed as: USP 438.

## RE 459 - Real Estate Valuation II (3)

Applies concepts from 439/539 to examine case studies in real estate apprais al and valuation. Topics include valuation for financial reporting, determining the highest and bestuse for a site, and determination of value following a property taking or condemnation.
Also offered for graduate-level credit as RE559 and may be taken only once for credit. .Prerequisite: RE439 and Fin 319.

## RE 460 - Real Estate Finance II (4)

Finance principles applied in the context of real estate investments. Fin ancial strength analysis, cash flow estimation, determining the cost of capital, various dis counted cash flow methods. Option valuation and real options approaches. Relative valuation approaches. Applied to the valuation of RealEstate Investment Trusts and other real estate developmententities.

## RE 501 - Research (1-12)

(Credit to be arranged.)

## RE 504 - Cooperative Education/Internship (1-12)

(Credit to be arranged.)

## RE 505-Reading and Conference (1-8)

(Credit to be arranged.)

## RE 507 - Seminar (1-8)

(Credit to be arranged.)

## RE 509- Practicum(1-8)

(Credit to be arranged.)

## RE 510 - SelectedStudies (1-8)

(Credit to be arranged.)

RE 510S - (1-8)

## RE 521 - Real Estate Finance I (4)

Introduces fundamental concepts and analytical techniques of commercial real es tate investment and finance. Concepts and techniques discussed include the characteristics of commercial real estate markets and realestate as a financial asset; lease and market analy sis; real estate inves tment strategies; investment pro-forma statements and fin ancial spreadsheet modeling; commercial realestate data analytics; mortgage financing and real estate private equity. It places an emphasis on quantitative analysis and real-world application.

## RE 522 - Real Estate Finance II (4)

Introduces advanced concepts and analytical techniques of commercial real estate investment and finance. Topics discussed include real estate investment trusts (REITs), mortgage-backed securities, real estate portfolio management, and financing decisions in the context of owner-occupiers (corporate realestate management). This course places an emphasis on quantitative analysis and real-world application.
Prerequisite: RE521.

## RE 523 - Real Estate Investment Analytics (4)

Students will learn financial approach to analyzing real es tate investments, analyzing case studies of investment decisions, learning s preadsheet-based software for analyzing leases and income flows, and understanding the tax implications of real estate investment.
Prerequisite: RE521 and RE 522 or permission of the instructor. RE522 may be taken concurrently.

## RE 531 - Executive Perspectives on Real Estate (1)

A series of presentations by localand regional leaders in the real estate industry highlighting is sues in the development of their bus iness and career opportunities in the realestate industry.

Prerequisite: admis sion to the Master of Real Estate Development program.

## RE 532 - Multifamily Property Management (4)

Gives students an overview of multifamily property management, including operations, maintenance, management and leasing of various types of apartment communities. The course will cover fundamental components of thehuman resources function for apartment communities, an overview of accounting and budgeting skills needed to meet a property owners' goals, fair hous ing laws, key components of a maintenance plan, and fundamental marketing tools and analysis for multifamily properties.

Also offered for undergraduate-level credit as Mgmt 432 and may be taken only once forcredit. Cross-Listed as: This is the same course as RE532S and may be taken only once for credit.

## RE 532S - Multifamily Property Management (4)

Gives students an overview of multifamily property management, including operations, maintenance, management and leas ing of various types of apartment communities. The course will cover fundamental components of the human resources function for apartment communities, an overview of accounting and budgeting skills needed to meet a property owners' goals, fair housing laws, key components of a maintenance plan, and
fundamental marketing tools and analysis for multifamily properties.

Also offered for undergraduate-levelcredit as Mgmt 432 and may be taken only once for credit. Cross-Listed as: This is the same course as RE532 and may be taken only once forcredit.

## RE 533 - Commercial Property and Asset Management (4)

Explores management of different classes of commercial real estate including office, retail, and industrial as well as management of a portfolio of real estate assets. Students will gain an understanding of the following areas of commercial property and asset management: financial/budgeting, facility, management, and legal. Discussions will cover leasing strategies and ways to enhance building value. Students will learn how to reposition an asset to increase its value and how to best use technology to manage assets.

Also offered for undergraduate-level credit as Mgmt 433 and may be taken only once for credit. Cross-Listed as: This is the same course as RE533S and may be taken only once forcredit.

## RE 533S - Commercial Property and Asset Management (4)

Explores management of different classes of commercial real estateincluding office, retail, and industrial as well as management of a portfolio of real estate assets. Students will gain an understanding of the following areas of commercial property and asset management:
financial/budgeting, facility, management, and legal. Discussions will cover leasing strategies and ways to enhance building value. Students will learn how to reposition an asset to increaseits value and how to best use technology to manage assets.
Also offered for undergraduate-level credit as Mgmt 433 and may be taken only once for credit. Cross-Listed as: This is the same course as RE533 and may be taken only once forcredit.

## RE 538S - Real Estate Law I (3)

Provides students with a comprehensive summary of real property froma legal pers pective with an emphasis on trans actional issues. Includes is sues relating to types of ownership, descriptions of property, easements, public and private limitations on use, real es tatecontracts, forms utilized in transfers, financing and title assurances. The class will enable students to understand the legal framework and the rights and res ponsibilities of owners and transferors/transferees of realproperty. This is the same course as USP 538 and may be taken only once for credit. Expected preparation for graduate students: RE 521.
Also offered for undergraduate-levelcredit as RE438 and may be taken only once for credit. Cross-Listed as: This is
the same course as USP 538 and may be taken only once for credit.

## RE 539 - Real Estate Valuation I (4)

Fundamentals of appraising real estate, focusing on valuation techniques for income-producing real estate as sets. Analysis of income and expenses, net operating income, leveraged and unleveraged cash flows, debt coverage ratios, direct capitalization, multipliers, and discounted cash flows. Marketability analysis, highest and best use concepts, zoning, environmental is sues, and the risks and rewards of real estate development are discussed.

Also offered for undergraduate-level credit as Fin 439 and may be taken only once for credit. . Prerequis ite: Fin 513 or Fin 551 or RE 521. Cross-Listed as: This is the same course as RE539S and may be taken only once for credit.

## RE 539S - Real Estate Valuation I (4)

Fundamentals of appraising real estate. Land utilization. Analysis of real estate values by approaches followed by governmental and private appraisers.

Also offered for undergraduate-level credit as Fin 439 and may be taken only once for credit. Prerequisite: Fin 513 or Fin 551 or RE 521. Cross-Listed as:This is the same course as RE539 and may be taken only once for credit.

## RE 548 - Real Estate Market Analysis (3)

A well-researched market study provides critical information that can make or break a development project. This course will provide students with the tools needed to evaluate trends and understand the key factors affecting real estate markets. The class will demonstrate where to get and analyze information on the demand for multifamily, hotel, office, industrial, and mixed-use developments. Expected preparation: RE 521 or USP 515.

## RE 559 - Real Estate Valuation II (3)

Applies concepts from439/539 to examine case studies in real estate apprais al and valuation. Topics include valuation for financial reporting, determining the highest and bestuse for a site, and determination of value following a property taking or condemnation.

Also offered for undergraduate-level credit as RE459 and may be taken only once for credit. . Prerequisite: RE 539 and RE 521.

## RE 562 - Real Estate Development Workshop(4)

Students forma real estate development team and produce an original development plan, including the development concept, the market analysis, theconceptual design, economic analysis capital and operations budget, and management plan. The student's plan will demons trate mastery of the development concepts and tools learned through the previous courses.

Prerequisite: USP 546 or instructor's consent. Course may be taken twice for credit with instructor's consent.

## RE 573 - Real Estate Economics (4)

Looks at the economics of real estate and housing, including land rent, interest rates, apartment rents, and housing prices, using an economic framework. Basic concepts in urban economics such as urbanization and agglomeration, tran sportation costs and congestion, inequality and segregation, growth controls and sprawl, as well as amenities, externalities, and public goods are reviewed. Explores the technique most commonly used in real estate and housing economics: hedonic pricing. Explores the rationale and impact of government intervention in the private real es tate market. Expected preparation: USP 515 or Fin 512.
Corequisite: Taking RE521 and RE 573 simultaneously is permitted. Cross-Listed as: This is the same course as USP 573 and may be taken only once for credit.

## Rus - Russian

## Rus 101 - First-Year Russian Term 1 (4)

An introduction toelementary Russian. Emphasis on listening comprehension and oral practice, the elements of grammar, vocabulary building, and elementary readings. This is the first course in a sequence of three: Rus 101, Rus 102, and Rus 103.

## Rus 102 - First-Year Russian Term 2 (4)

An introduction to elementary Russian. Emphasis on listening comprehension and oral practice, the elements of grammar, vocabulary building, and elementary readings. This is the second course in a sequence of three: Rus 101, Rus 102, and Rus 103.

## Rus 103 - First-Year Russian Term3 (4)

An introduction to elementary Russian. Emphasis on lis tening comprehension and oral practice, the elements of grammar, vocabulary building, andelementary readings. This is the third course in a sequence of three: Rus 101, Rus 102, and Rus 103.

## Rus 111 - Introduction to FlagshipStudies Term 1 (1)

An introduction to is sues related to language acquisition, proficiency standards, and assessment instruments for students in the Russian Flagship Program. This is the first course in a sequenceof three: Rus 111, Rus 112, and Rus 113.

Prerequisite: admis sion to the Rus sian Flag ship Partner Program.

## Rus 112 - Introduction to FlagshipStudies Term 1 (1)

An introduction to is sues related to language acquisition, proficiency standards, and assessment instruments for students in the Rus sian Flagship Program. This is the second course in a sequence of three: Rus 111, Rus 112, and Rus 113.

Prerequis ite: admis sion to the Rus sianFlagship Partner Program.

## Rus 113 - Introduction to FlagshipStudies Term 3 (1)

An introduction to is sues related tolanguage acquisition, proficiency standards, and assessment instruments for students in the Rus sian Flagship Program. This is the third course in a sequence of three: Rus 111, Rus 112, and Rus 113.

Prerequisite: admis sion to the Rus sian Flagship Partner Program.

## Rus 150 - Beginning Flagship Russian Term 1 (6)

Intensive introduction to fundamentals of Rus sian focusing on language production in high-frequency settings. Conducted primarily in Russian, the course prepares students for study in Russia and is a prerequisite for further study in the Rus sian Flagship Program. This is the first course in a sequence of three: Rus 150 , Rus 151 , and Rus 152.

## Rus 151 -Beginning Flagship Russian Term 2 (6)

Intensive introduction to fundamentals of Russian focusing on language production in high-frequency settings. Conducted primarily in Russian, the course prepares students for study in Russia and is a prerequisite for further study in the Russian Flagship Program. This is the second course in a sequence of three: Rus 150, Rus 151, and Rus 152.

## Rus 152 - Beginning Flagship Russian Term 3 (6)

Intensive introduction to fundamentals of Russian focusing on language production in high-frequency settings. Conducted primarily in Russian, the course prepares students for study in Russia and is a prerequisite for further study in the RussianFlagship Program. This is the third course in a sequence of three: Rus 150, Rus 151, and Rus 152.

Rus 199 -Special Studies (1-12)
(Credit to be arranged.)

## Rus 201 -Second-Year Russian Term 1 (4)

Intensive review of basic materials introduced in first-year programand further development of communication skills. This is the first course in a sequence of three: Rus 201, Rus 202, and Rus 203. Expected preparation: Rus 103.

## Rus 201H-Second-year Russian Heritage ()

Designed for students who speak Rus sian but have limited writing skills. Covers the content of second-year Rus sian with particularattention to writing. Rus 203 H satis fies the PSU BA requirement and prepares students to enter Rus 301H.

## Rus 202 -Second-Year Russian Term 2 (4)

Intensive review of basic materials introduced in first-year programand further development of communication skills. This is the second course in a sequence of three: Rus 201, Rus 202, and Rus 203. Expected preparation: Rus 103.

## Rus 202H-Second-year Russian Heritage ()

Designed for students who speak Rus sian but have limited writing skills. Covers the content of second-year Rus sian with particular attention to writing. Rus 203 H satis fies the PSU BA requirement and prepares students to enter Rus 301H.

## Rus 203 -Second-Year Russian Term 3 (4)

Intensive review of basic materials introduced in first-year programand further development of communication skills. This is the third course in a sequence of three: Rus 201, Rus 202, and Rus 203. Expected preparation: Rus 103.

## Rus 203H-Second-year Russian Heritage ()

Designed for students who speak Rus sian but have limited writing skills. Covers the content of second-year Rus sian with particular attention to writing. Rus 203 H satisfies the PSU BA requirement and prepares students to enter Rus 301H.

## Rus 299 - Special Studies (1-12)

(Credit to be arranged.)

## Rus 301 - Third-Year Russian Term 1 (4)

Focus on acquisition of vocabulary, practical application. Intensive practice in speaking listening, reading and
writing. This is the first course in a sequence of three: Rus 301, Rus 302, and Rus 303. Expected preparation: Rus 203.

## Rus 301H- Third-year Russian Heritage ()

Designed forstudents fromRussian-speaking backgrounds. Covers the content of third-year Russian with particular attention to culture, stylistic registers, accuracy. Prepares students to enter Rus 411 (Advanced Russian) and to apply for the PSU Russian Language Flagship program.

## Rus 302 - Third-Year Russian Term 2 (4)

Focus on acquisition of vocabulary, practical application. Intensive practice in speaking listening, reading and writing. This is the second course in a sequence of three: Rus 301, Rus 302, and Rus 303. Expected preparation: Rus 203.

## Rus 302H- Third-year Russian Heritage ()

Designed forstudents fromRussian-speaking backgrounds. Covers the content of third-year Russian with particular attention to culture, stylistic registers, accuracy. Prepares students to enter Rus 411 (Advanced Russian) and to apply for the PSU Russian Language Flagship program.

## Rus 303 - Third-Year Russian Term3 (4)

Focus on acquisition of vocabulary, practical application. Intens ive practice in speaking listening, reading and writing. This is the third course in a sequence of three: Rus 301, Rus 302, and Rus 303. Expected preparation: Rus 203.

## Rus 303H- Third-year Russian Heritage ()

Designed forstudents fromRussian-speaking backgrounds. Covers the content of third-year Russian with particular attention to culture, stylistic registers, accuracy. Prepares students to enter Rus 411 (Advanced Russian) and to apply for the PSU Rus sian Language Flagship program.

## Rus 325 - Russian Phonetics and Phonology (4)

Introduction to the sounds of Rus sian: their place and manner of articulation (phonetics) as well as how they pattern with respect to each other and as influenced by
morphological and syntactic factors (phonology). Conducted in English. Expected preparation: Rus 102.

## Rus 330U - Russian Culture and Civilization (4)

A multimedia survey of major developments in Russian art, architecture, music, dance, theater, cinema and literature. The class focuses on ways major works relate to the artistic atmosphere of theirtimes and on how subsequent generations have reinterpreted and reused them. Taught in English.

## Rus 331U - Russian Film Topics (4)

Surveys cinematic narratives significant to Rus sian culture, with a focus on is sues of gender and/or national identity. Taught in English.

## Rus 341 - Introduction to Russian Literature (4)

Study of selected short stories of the 19th century. For nonnative speakers only. This is the first course in a sequence of two: Rus 341 and Rus 342. Expected preparation: Rus 203.

## Rus 342 - Introduction to Russian Literature (4)

Study of selected short stories of the 19th century. For nonnative speakers only. This is the second course in a sequence of two: Rus 341 and Rus 342. Expected preparation: Rus 203.

## Rus 399 - Special Studies (1-6)

(Credit to be arranged.)

## Rus 401 - Research (1-6)

(Credit to be arranged.)

## Rus 404 - Cooperative Education/Internship (1-12)

(Credit to be arranged.)

## Rus 405 - Reading and Conference (1-12)

(Credit to be arranged.)

## Rus 407 -Seminar (1-12)

(Credit to be arranged.)

## Rus 408 -Workshop(1-12)

(Credit to be arranged.)

## Rus 409-Practicum(1-12)

(Credit to be arranged.)

## Rus 410 -SelectedTopics (1-12)

(Credit to be arranged.)

## Rus 411 -Advanced Russian (4)

Special problems of Rus sian grammar; selected writing and reading assignments and dis cussion. For non-native speakers of Russian only. This is the first course in a sequence of three: Rus 411, Rus 412, and Rus 413. Expected preparation: Rus 303.
Also offered for graduate-level credit as Rus 511 and may be taken only once for credit. .

## Rus 412 -Advanced Russian (4)

Special problems of Russian grammar; selected writing and reading assignments and discussion. For non-native speakers of Russian only. This is the second course in a sequence of three: Rus 411, Rus 412, and Rus 413. Expected preparation: Rus 303.
Also offered for graduate-level credit as Rus 512 and may be taken only once for credit. .

## Rus 413 -Advanced Russian (4)

Special problems of Russian grammar; selected writing and reading assignments and discussion. For non-native speakers of Russian only. This is the third course in a sequence of three: Rus 411, Rus 412, and Rus 413. Expected preparation: Rus 303.
Also offered for graduate-level credit as Rus 513 and may be taken only once for credit. .

## Rus 414 - Advanced Russian Grammar (4)

Systematic study of Rus sian grammar for advanced students and prospective teachers. Expected preparation: Rus 301.
Also offered for graduate-level credit as Rus 514 and may be taken only once for credit. .

## Rus 416 - Readings in Russian (2)

A variable-content course designed to give advanced students of Russian experience reading in a variety of content areas. Rus 416 is to be taken in conjunction with regularly scheduled corequis ite courses. Students taking a
corequisite course will do part of the required reading for that course in Russian. Expected preparation: Rus 342.

## Rus 420 - Topics in Russian History (4)

A content-based language course based on study of major is sues in Russian and Soviet history such as Peter I, Westerners and Slavophiles, the Thaw, and others. May be repeated forcredit when topics differ. Expected preparation: Rus 342.
Also offered for graduate-level credit as Rus 520 and may be taken only once forcredit. . Prerequisite: junior standing.

## Rus 421 - Topics in Contemporary Russian Culture (4)

Study of current is sues in post-Soviet society such as political proces ses, educational reform, migration, and others. May be repeated for credit when topics differ. Expected preparation Rus 342.
Also offered for graduate-level credit as Rus 521 and may be taken only once for credit. .

## Rus 427 - Topics in Russian Literature of the 19th

 Century (4)Representative literature of the major Rus sian writers of the nineteenth century. Such topics as Golden Age, or the 19th Century Short Story. Expected preparation: Rus 303.
Also offered for graduate-level credit as Rus 527 and may be taken only once forcredit. .

## Rus 433 - Topics in Russian Literature of the 20th Century (4)

Representative literature of major Russian writers of the twentieth century. Such topics as Soviet Satire, The Thaw, Glasnost. Expected preparation: Rus 303. May be repeated for credit when topic differs.

Also offered for graduate-level credit as Rus 533 and may be taken only onceforcredit. .

## Rus 441U- Russian Literature in Translation: Nineteenth Century (4)

Major works of nineteenth-century Russian literature. Readings, lectures, and discussion in English. Expected preparation: Sophomore Inquiry or 4 credits of upper division literature.

## Rus 442U- Russian Literature in Translation: Twentieth Century (4)

Major works of twentieth-century Russian literature. Readings, lectures, and discussions in English. Expected preparation: Sophomore Inquiry or 4 credits of upper division literature.

## Rus 444 -FlagshipStudies: Globalization Term 1 (2)

A Russian across the curriculumcourse aligned with PSU's University Studies Program. Flagship students develop advanced reading, writing, speaking and listening skills while exploring "Globalization" in Russian. This is the first course in a sequence of three: Rus 444, Rus 445, and Rus 446.

Prerequisite: admis sion to the Rus sianFlagship Program.
Rus 445 -FlagshipStudies: Globalization Term 2 (2)
A Russian across the curriculumcourse aligned with PSU's University Studies Program. Flagship students develop adv anced reading, writing, speaking and listening skills while exploring "Globalization" in Russian. This is the second course in a sequence of three: Rus 444, Rus 445, and Rus 446.
Prerequisite: admis sion to the Russian Flagship Program.
Rus 446 -FlagshipStudies: Globalization Term 3 (2)
A Russian across the curriculumcourse aligned with PSU's Univers ity Studies Program. Flagship students develop advanced reading, writing, speaking and listening skills while exploring "Globalization" in Russian. This is the third course in a sequenceof three: Rus 444, Rus 445, and Rus 446.

Prerequis ite: admis sion to the Rus sianFlagship Program.
Rus 454 -FlagshipStudies: American Studies (2)
A Russian across the curriculumcourse aligned with PSU's University Studies Program. Flagship students perfect advanced reading, writing, speaking and listening skills while exploring the U.S. Jazz Age in Russian.

Prerequis ite: admis sion to the Rus sian Flagship Program.

## Rus 455 -FlagshipStudies: European Studies (2)

A Russian across the curriculumcourse aligned with PSU's Univers ity Studies Program. Flagship students perfect advanced reading, writing, speaking and listening skills while exploring the modern Europeanhis tory and culture in Russian.

Prerequis ite: admis sion to the Russian Flagship Program.

## Rus 456 - FlagshipStudies: Environmental Sustainability (2)

A Russian across the curriculumcourse aligned with PSU's University Studies Program. Flagship students perfect advanced reading, writing, speaking and listening skills while exploring the questions of ecology and sustainability in Russian.
Prerequisite: admis sion to the Russian Flagship Program.

## Rus 457 - FlagshipStudies: Russian in the Major Term 1 (2)

A Russian across the curriculumcourse designed to permit advanced Flagship students to develop appropriate vocabulary, discourse strategies, and research skills in their respective majors. This is the first coursein a sequence of three: Rus 457, Rus 458, and Rus 459.

Prerequisite: admission to the Russian Flagship Program.

## Rus 458 - FlagshipStudies: Russian in the Major Term

 2 (2)A Russian across the curriculumcourse designed to permit advanced Flagship students to develop appropriate vocabulary, discourse strategies, and research skills in their respective majors. This is the third course in a sequence of three: Rus 457, Rus 458, and Rus 459.

Prerequisite: admission to the Russian Flagship Program.
Rus 459 - FlagshipStudies: Russian in the Major Term 3 (2)
A Russian across the curriculumcoursedesigned to permit advanced Flagship students to develop appropriate vocabulary, discourse strategies, and research skills in their respective majors.
Prerequisite: admission to the Russian Flagship Program.

## Rus 494 - Russian Linguistics (4)

Introduction to the basic concepts of linguistics and their application to Russian. Analysis of the phonetics, phonemics, syntax and morphology of modern Russian. Recommended prerequisite: Rus 303.

## Rus 497 - Applied Russian Linguistics (4)

A practical application of linguistics to modern Russian. Emphas is on a contrastive analy sis of the structures of Russian and English. Recommended prerequisite: Rus 303.

## Rus 501 - Research (1-9)

(Credit to be arranged.)

## Rus 504 - Cooperative Education/Internship (1-9)

(Credit to be arranged.)

## Rus 505 - Reading and Conference (1-12)

(Credit to be arranged.)

## Rus 507 -Seminar (1-12)

(Credit to be arranged.)

## Rus 508 -Workshop(1-8)

(Credit to be arranged.)

## Rus 509 -Practicum(1-6)

(Credit to be arranged.)

## Rus 510 -SelectedTopics (1-12)

(Credit to be arranged.)

## Rus 511 - Advanced Russian (4)

Special problems of Russian grammar; selected writing and reading assignments and dis cussion. For non-native speakers of Russian only. This is the first course in a sequence of three: Rus 511, Rus 512, and Rus 513. Expected preparation: Rus 303.

Also offered for undergraduate-level credit as Rus 411 and may be taken only once for credit. .

## Rus 512 - Advanced Russian (4)

Special problems of Rus sian grammar; selected writing and reading assignments and discussion. For non-native speakers of Russian only. This is the second course in a sequence of three: Rus 511, Rus 512, and Rus 513. Expected preparation: Rus 303.

Also offered for undergraduate-level credit as Rus 412 and may be taken only once for credit. .

## Rus 513 - Advanced Russian (4)

Special problems of Rus sian grammar; selected writing and reading assignments and dis cussion. For non-native speakers of Russian only. This is the third course in a sequence of three:Rus 511, Rus 512, and Rus 513. Expected preparation: Rus 303.
Also offered for undergraduate-level credit as Rus 413 and may be taken only once for credit. .

## Rus 514 - Advanced Russian Grammar (4)

Systematic study of Rus sian grammar for advanced students and prospective teachers. Expected preparation: Rus 301.

Also offered for undergraduate-level credit as Rus 414 and may be taken only once for credit.

## Rus 520 - Topics in Russian History (4)

A content-based language course based on study of major is sues in Russian and Soviet history such as Peter I, Westerners and Slavophiles, the Thaw, and others. May be repeated forcredit when topics differ. Expected preparation: Rus 342.
Also offered for undergraduate-level credit as Rus 420 and may be taken only once for credit. . Prerequisite:junior standing.

## Rus 521 - Topics in Contemporary Russian Culture (4)

Study of currentissues in post-Sovietsociety such as political processes, educational reform, migration, and others. May be repeated for credit when topics differ. Expected preparation:Rus 342.
Also offered for undergraduate-levelcredit as Rus 421 and may be taken only once for credit. .

## Rus 527 - Topics in Russian Literature of the 19th

 Century (4)Representative literature of the major Rus sian writers of the nineteenth century. Such topics as Golden Age, or the 19th Century Short Story. Expected preparation: Rus 303.
Also offered for undergraduate-level credit as Rus 427 and may be taken only once for credit. .

## Rus 533 - Topics in Russian Literature of the 20th

 Century (4)Representative literature of major Russian writers of the twentieth century. Such topics as Soviet Satire, The Thaw, Glasnost. May be repeated for credit when topic differs. Expected preparation:Rus 303.
Also offered for undergraduate-level credit as Rus 433 and may be taken only once for credit. .

## Rus 594 - Russian Linguistics (4)

Introduction to the basic concepts of linguistics and their application to Russian. Analy sis of the phonetics, phonemics, syntax and morphology of modern Russian. Recommended prerequisite: Rus 303.

## Rus 597 - Applied Russian Linguistics (4)

A practical application of linguistics to modern Russian. Emphas is on a contrastive analysis of the structures of Russian and English. Recommended prerequisite: Rus 303.

## Sci - Science Ed: Center for

## Sci 199-Special Studies (1-8)

(Credit to be arranged.)

## Sci 201 -Natural Science Inquiry (4)

This is the University Studies Sophomore Inquiry course that serves as the gateway to the Science in the Liberal Arts curriculum. The course aims to introduce students to the knowledge-making strategies of science. The curriculum is taught using s mall group and class projects that engage students in various science inquiry activities. Students gain experience in gathering and understanding scientific information, data management, interpretation and presentation, making and defending knowledgeclaims, working collaboratively, writing technically, and communicating scientific results.
Cross-Listed as:This is the same course as UnSt 286.

## Sci 311U-Teaching Everyday Science (4)

Two-termsequence designed to immerse potential mathematics and science teachers in laboratory and thinking experiences that they can use as a foundation for their own understanding of the physical sciences and related mathematics and curriculumdevelopment in future teaching experiences. In addition to experiences in the laboratory, environmental impact issues will be in vestigated. Includes laboratory and/or fieldwork. This is the first course in a sequence of two: Sci 311 and Sci 312. Recommended prerequis ite: Natural Science Inquiry.

## Sci 312U - Teaching Everyday Science (4)

Two-termsequence designed to immerse potential mathematics and science teachers in laboratory and thinking experiences that they can use as a foundation for their own understanding of the physical sciences and related mathematics and curriculumdevelopment in future teaching experiences. In addition to experiences in the laboratory, environmental impact issues will be investigated. Includes laboratory and/or fieldwork. This is the second course in a sequence of two: Sci311 and Sci 312. Recommended prerequis ite: Natural Science Inquiry.

## Sci 313U-Environmental Mathematical Modeling (4)

An introduction todifferential and integral calculus, this course is intuitive in approach andemphasizes applications, especially with respect to environmental is sues. The interested student may follow it with a more extensive and rigorous calculus sequence. Includes laboratory and/or fieldwork. Recommended prerequisites: Natural Science Inquiry, Mth 111.

## Sci 314U-Environmental Statistics (4)

Explores a selection of mathematical topics in the context of environmental is sues, using real data. Topics will
include statistics, data display, data analysis, probability, and probability distributions. Includes laboratory and/or fieldwork. Recommended prerequisites: Natural Science Inquiry, Mth 95.

## Sci 315U- General Astronomy I (4)

Introductory historical, descriptive, and interpretive study of as tronomy. Emphas is is on the basic scientific methods as they apply to astronomical problems. Detailed examination of the earth, followed by a survey of the other members of the solar system. Survey of the stars, their types, grouping, and motions. Models for the evolution of the Universe and the possibility of life elsewhere. The nature of light, the types of information it carries, and the types of devices used to detect it. Includes laboratory and/or fieldwork. This is the first course in a sequence of two: Sci 315U and Sci 316U. This is the same course as Ph 361 U and may be taken only once for credit. Expected preparation: Natural Science Inquiry. Taught by a faculty member from the Department of Physics.
Cross-Listed as: Ph 361U.

## Sci 316U- General Astronomy II (4)

Introductory historical, descriptive, and interpretive study of as tronomy. Emphas is is on the basic scientific methods as they apply to astronomical problems. Detailed examination of the earth, followed by a survey of the other members of the solar system. Survey of the stars, their types, grouping, and motions. Models for the evolution of the Universe and the possibility of life else where. The nature of light, the types of information it carries, and the types of devices used to detect it. Inclu des laboratory and/or fieldwork. This is the second course in a sequence of two: Sci 315U and Sci316U. This is the same course as Ph 362U and may be taken only once for credit. Expected preparation: Natural Science Inquiry. Taught by a faculty member from the Department of Physics.
Cross-Listedas: Ph 362U.

## Sci 317U- Fractals, Chaos, and Complexity (4)

Introduction to the physics of fractals in nature, chaos, and complexity. Computersimulations and desktop experiments involving fractals, chaos, and complex systems. Recommended prerequisite: Natural Science Inquiry. Taught by a faculty member fromthe Department of Physics.

## Sci 318U-Complexity and the Universe I (4)

Introduction to the physics of complexity and other current concepts in physics. Computer simulations and desktop experiments involving fractals, chaos, and complex systems. Includes laboratory and/or fieldwork. Recommended prerequisite: Natural Science Inquiry.

Taught by a faculty member fromthe Department of Physics.

## Sci 319U-Complexity and the Universe II (4)

Continuation of Sci 318/Ph 366. Emphasizes scientific cosmology with a focus on understanding how insights gained fromphysics and astronomy affect your view of the universe and your place in it. Students participate actively in seeing how some of the information was gathered, help critically analyze what to believe about the history and arrangement of the universe and what it means to them. Includes laboratory and/or fieldwork. Recommended prerequisite: Natural Science Inquiry. Taught by a faculty member from the Department of Physics.

## Sci 320U-Rates of Change (4)

Explores rates of change in a laboratory-style format. Analyzes the relationships between quantities and rates using hand-drawn and computer-generated graphic representations. Provides resources for pre-service teachers.

## Sci 321U-Energy and Society I (4)

Study of the generation and usage of energy, including the technical, economic, social, and political is sues related to energy production and end uses. Examination of energy resources, methods of producing and converting various forms of energy, energy conservation, and environmental and economic implications of energy production and energy policies. Includes laboratory and possibly fieldwork. This is the first course in a sequence of two: Sci 321 and Sci 322. Recommended prerequisite: Natural Science Inquiry.

## Sci 322U-Energy and Society II (4)

Study of the generation and usage of energy, including the technical, economic, social, and political is sues related to energy production and end uses. Examination of energy resources, methods of producing and converting various forms of energy, energy conservation, and environmental and economic implications of energy production and energy policies. Includes laboratory and possibly fieldwork. This is the second course in a sequence of two: Sci 321 and Sci 322. Recommended prerequisite: Natural Science Inquiry.

## Sci 325U-Science of a Hydrogen Economy (4)

Hydrogen is considered as an ideal energy source. Explores various methods of hydrogen production, storage,
delivery, and uses. Includes discussion of hy drogen's image as an abundant, clean, high energy output, easily obtainable, safe energy source. Considers safety is sues and codes/standards fromvarious related agencies and organizations that would have been necessary to have avoided such historical mishaps as those in volving the Hindenberg and the space shuttle Challenger. Recommended prerequisite: Natural Science Inquiry.

## Sci 327U- Oceans and Society (4)

Provides a working knowledgeof how the physical, chemical and biological ocean environment impacts the development and distribution of marine communities. Discussions on how humans interface with marine systems, how marine systems impact global sustainability, the environmental, economic and ethical res ponsibilities humans have for our marine systems.

## Sci 331U- AI: Urban Air Pollution (4)

Interaction of the atmosphere with other earth systems, chemical cycling, and the effect of humans on the atmosphere will be explored. The physical and chemical properties and interactions of the atmosphere will be investigated through laboratory investigations, fieldwork, and computer modeling. Topics will include urban air quality, global climate change, and the " management" of the atmosphere. Includes laboratory and/or fieldwork. This is the first course in a sequenceof two: Sci 331 and Sci 332. Recommended prerequisite: Natural Science Inquiry.

## Sci 332U-AI: Urban AirPollution (4)

Interaction of the atmosphere with other earth systems, chemical cycling, and the effect of humans on the atmosphere will be explored. The physical and chemical properties and interactions of the atmosphere will be investig ated through laboratory investigations, fieldwork, and computer modeling. Topics will include urban air quality, global climate change, and the " management" of the atmosphere. Includes laboratory and/or fieldwork. This is the second course in a sequence of two: Sci331 and Sci 332. Recommended prerequisite: Natural Science Inquiry.

## Sci 333U- Climate and Water Resources (4)

An inquiry-based examination of the principal controls on climate and hydrology, with emphasis on processes and interactions; students will do fieldwork, data analysis, and laboratory work. Recommended prerequisite: Natural Science Inquiry. Also listed as Geog 310U; course may be taken only once for credit.
Cross-Listed as: Geog 310U.

## Sci 334U-Climate Variability and Change (4)

Provides an understanding of how and why climate varies and changes over space and time. Climate variability is explored across a range of scales fromice ages to monsoon circulations. Examines the scientific basis for anthropogenic climate change and how it differs from natural variability. Students will learn by analyzing climate data, performing experiments with climate models, and researching how climate variability and change impact everyday life. Includes laboratory and/or fieldwork.

Cross-Listed as: Also offered as Geog 312U and may betaken only once forcredit.

## Sci 335U-Water in the Environment I (4)

Studies of the unique properties of water in all of its roles, including a study of the water cycle, water resources, treatment of municipal water, and wastewater treatment. Special attention will be placed on natural waters as a resource, including natural and introduced constituents and the movements of natural waters. Includes laboratory and fieldwork. This is the first course in a sequence of two: Sci 335 and Sci 336. Recommended prerequisite: Natural Science Inquiry.

## Sci 336U-Water in the Environment II (4)

Studies of the unique properties of water in all of its roles, including a study of the water cycle, water resources, treatment of municipal water, and wastewater treatment. Special attention will be placed on natural waters as a resource, including natural and introduced constituents and the movements of natural waters. Includes laboratory and fieldwork. This is the second course in a sequence of two: Sci 335 and Sci 336. Recommended prerequisite: Natural Science Inquiry.

## Sci 338U-Investigating Forest Ecosystems (4)

Fundamental concepts of terres trial ecology in the context of present unresolved forest managementissues.
Participants will learn an appropriate set of field skills in soil and vegetation monitoring and engage in a short-term research project at a local site. Socio-political context of Pacific Northwest forest management will be covered through guided controversies and guest speakers.
Prerequisite: one ecology or environmental science course.
Sci 341L - Lab for Bi 341 (0)
Lab for Bi 341.
Corequisite: Sci341U.

## Sci 341U-Biology Concepts and Applications I (4)

Two-termcourse focusing on four main topics: classical Mendelian and currentmolecular genetics, evolution and
predator/prey interactions, growth and metabolism, and biomes and biodiversity. In each topic area students will participate in laboratory and or field components, discussion, and Internet exercises. Includes laboratory and/or fieldwork. This is the first course in a sequence of two: Sci 341 and Sci 342. Recommended prerequisite: NaturalScience Inquiry.
Corequisite: Sci 341L.
Sci 342L - Lab for Sci 342 (0)
Lab for Sci 342.
Corequisite: Sci342U.

## Sci 342U-Biology Concepts and Applications II (4)

Two-term course focusing on four main topics: classical Mendelian and current molecular genetics, evolution and predator/prey interactions, growth and metabolism, and biomes and biodiversity. In each topic area students will participate in laboratory and or field components, discussion, and Internet exercises. Includes laboratory and/or fieldwork. This is the second course in a sequence of two: Sci 341 and Sci342. Recommended prerequisite: NaturalScience Inquiry.
Corequisite: Sci 342L.

## Sci 343U - Columbia Basin Plant Communities (4)

In this two-termcoursestudents will explore the relationships found in alpine, desert, forest, and grassland plant communities. They will gain an understanding of how these plant communities interact with their environment and why they exhibit certain characteristics and processes. Includes laboratory and fieldwork. Recommended prerequisite: Natural ScienceInquiry.

## Sci 345U-Old Growth Forest Ecology and Management I (4)

Explores the ecological characteris tics of old growth forests, including the outstanding biodiversity that exists at multiple levels, as well as the management paradigms that have impacted these systems in the Pacific Northwest (U.S. and Canada), including ethical, social, economic, and political as pects of forestmanagement. Sci 345 includes laboratory and local fieldwork plus projects involving: analys is of environmentalimpact statement alternatives, evaluation of management is sues, and ad visory statements for governmental activities. Sci346 involves more extensive fieldwork, data analysis, and presentations. This is the first course in a sequenceof two: Sci 345 and Sci 346. Recommended prerequisite: Natural Science Inquiry.

## Sci346U-Old Growth Forest Ecology and Management II (4)

Explores the ecological characteristics of old growth forests, including the outstanding biodiversity thatexists at multiple levels, as well as the management paradigms that have impacted these systems in the Pacific Northwest (U.S. and Canada), including ethical, social, economic, and political aspects of forest management. Sci 345 includes laboratory and local fieldwork plus projects involving: analys is of environmental impact statement alternatives, evaluation of management is sues, and advisory statements for governmental activities. Sci 346 in volves more extensive fieldwork, data analy sis, and presentations. This is the second course in a sequence of two: Sci 345 and Sci 346. Recommended prerequisite: Natural Science Inquiry.

## Sci 347 U-Science, Gender, and Social Context I (4)

Considers how gender, race and sexuality in fluence and are constructed by the theories and practiceofscience, using historical and contemporary examples. Explores the strengths and limitations of science to describe and predict human and non-human natural phenomena. Topics may include ecological, evolutionary, and environmental sciences. Laboratory and/or field experiences are included and emphasized. Companion course to Sci 348U; can be taken in any order.
Cross-Listed as: This course is the same as WS 347U and may only be taken once for credit.

## Sci 348U-Science, Gender, and Social Context II (4)

Considers how gender, race and sexuality influence and are constructed by the theories and practice of science, using historical and contemporary examples. Explores the strengths and limitations of science to describe and predict human and non-human natural phenomena. Topics may include organis mal, cell/molecular, or biomedical sciences. Laboratory and/or field experiences are included and emphasized. Companion course to Sci 347 U ; can be taken in any order.
Cross-Listed as:This course is the same as WS 348U and may only be taken once for credit.

## Sci 350U - Context of Science in Society (4)

Addresses the promises and limitations of the scientific enterprise in the framework of "real world" social, economic, political, and ethical is sues. Courses also address the historical and cultural role of science and technology, providing a link between laboratory science and contemporary society. Some CSS courses introduce risk-benefit analyses and decision-making methodologies. The prerequisite course for Context of Science in Society courses is Sci 201 Natural Science Inquiry or consent of the instructor.

## Sci 351U-Northwest Wetlands: Conservation, Restoration, and Mitigation (4)

Focus on science and public policy is sues in wetland conservation, res toration, and mitigation, especially in Oregon and thePacific Northwest. Recommended prerequisite: Natural Science Inquiry or consent of instructor.

## Sci 352U-Science andPolicy of Climate Change (4)

Evaluates the scientific data and the policy statements concerning the potential for human impact of climate, and in particular the questions of the existence and impacts of global warming. The interaction between scientific analys is and policy analy sis will be explored, and students will consider the roles that citizens, scientists, and policy make in developing local, regional, and global res ponses to climate change. Recommended prerequisite:Natural Science Inquiry.

## Sci 353U-Radiation in the Environment (4)

Examines sources of radiation and the hazards they represent. Students will explore the interaction of radiation with matter, including living tissue, and examine dosage and risk assessment. Topics include:fundamentals of electromagnetic radiation, nuclei and radioactive decay; cosmic background radiation and radon gas; nuclear chain reactions and atomic weapons; nuclear powergeneration, waste disposal and nuclear dis asters; medical x-rays and non-ionizing radiation from microwaves and cellular phones.

Prerequisite:Upper-division standing. Cross-Listed as: This is the same course as Ph 353 U and may be taken only once forcredit.

## Sci 354U-Science andPolitics of Columbia River Decisions (4)

Exploration of case studies of relationships between science and politics in making decisions about controversial Columbia River management is sues. Students will identify a particular is sue and its related stakeholders, define objectives, collect as well as analyze scientific data and political positions, and participate in role-playing decisions as stakeholder groups and as management committees.
Prerequisite: Natural Science Inquiry.

## Sci 355U-Science Through Science Fiction (4)

This class uses science fiction literature to examine a wide variety of topics in science. Recommended prerequisite: NaturalScience Inquiry. Alsolisted as Ph 378; course may be taken only once forcredit.

## Sci 356U-Environmental Success Stories (4)

A positive reflection on how and why we can approach environmentalcatastrophes with willingness and certainty that we can develop strategies to overcome current and future challenges. Case-studies, work with community organizations and evaluation of the literature will help students identify key elements of successful endeavors and create best-practices for successful environmental problem solving. Community connections will also focus on how to create sustainable and resilient solutions by identifying and supporting stakeholder values.

## Sci 357U -Sustainability in the United States-Mexico Border Region (4)

Explores environmental and economic sustainability is sues at the United States-Mexico border. Dialogue with United States and Mexican border residents; tours of immigration facilities and multinational factories; homestays with working class families; and service with Mexican-based agencies. Spanish language skills not required.

## Sci 359U-Biopolitics (4)

Designed to introduce the ethical, social, and political implications of knowledge and technologies attending advances in reproductive medicine and molecular genetics, including: in vitro fertilization, fetal surgery, and somatic cell gene therapy. Particular attention is paid to the manner in which such advances are likely to affect women's lives. Recommended prerequisite: Natural Science Inquiry.

## Sci 361U-Science: Power-Knowledge (4)

Systematically examines orthodoxportrayals of science in comparis on to recent anthropological, feminist, and poststructuralist accounts in an attemptto formulate a fresh understanding of the public's science literacy as a critical component of democratic political practice and civic responsibility. Recommended prerequisite: Natural Science Inquiry.

## Sci 365U - The Science of Gendered Bodies (4)

The scientific gendering of the human body is studied from an interdisciplinary and intersectional queer and feminist pers pective integrating biology, health and medicine with current and historical social, cultural and political forces.
Cross-Listed as:This is the same course as WS 365U and may be taken only once for credit.

## Sci 367U-STEM Research:Solving Today's Problems (4)

Students will gain tools for success in STEM disciplines, including professional skills, scientific research, scientific literature and writing, and working in interdisciplinary teams to address complexissues such as global environmental challenges. Students will gain the skills, knowledge and social capital needed to engage in locally and globally relevant research.

## Sci 368U- Green Roof Ecology (4)

An Undergraduate Research Experience investigating how green roof plant communities function in an urban rooftop en vironment. Working in small groups, students pursue an original research project and deliver a final technical report to PSU green roof researchers. The research topic changes each term- potential topics include plant communities; urban habitats and climate resilience; ecological services provided by green roofs; or impacts on air and water quality. Assignments focus on scientific writing and realworld research practices.

## Sci 369U- Green Roof Monitoring and Ecodesign (4)

An Undergraduate Research Experience investigating the efficiency and/or resiliency of living roofs in an urban environment. Working in small groups, students pursue an original research project and deliver a final technical report to PSU green roof researchers. The research topic changes each term- potential topics include stormwater mitigation, energy efficiency, or impacts on local air and water quality. Assignments focus on scientific writing and realworld research practices.

## Sci 382U-Introduction to Nanoscience and Nanotechnology (4)

Basic introduction to nanoscience and nanotechnology for all interested science, en gineering and social science and humanities students. This is the s ame course as Ph 382 U and may be taken only once for credit.
Prerequisite: sophomore inquiry - Natural Science Inquiry. Cross-Listed as: Ph 382U.

Sci 383U- Nanotechnology: Simulation \& Design (4)
Introductory circuit simulation; properties of selected nanotechnology devices and systems; nanodevice simulation; development of nanodevice models. This is the same course as ECE 383U and may be taken only once for credit.
Prerequisite: upper-division standing or permis sion of the instructor. Cross-Listed as: ECE 383U.

## Sci 384 -From Contemporary Nanoscience Towards Sustainable Nanotechnologies (4)

Provides an overview of nanoscience/technology, its interdisciplinarity, how it complements biomedical, engineering, economic, and environmental studies and gives students an appreciation of why "soft" machines are favored over "hard" machines. As second part of PH 382U (cross listed SCI 382U), it provides a
scientific/technological basis for sustainable future technology developments.

Cross-Listed as: This is the same course as Ph 384 and may be taken only once for credit. .

## Sci 399 -Special Studies (1-5)

(Credit to be arranged.)

## Sci 399U-Special Studies (4)

(Credit to be arranged.)

## Sci 401 - Research (1-8)

(Credit to be arranged.)

## Sci 402 - Independent Study (1-8)

(Credit to be arranged.)

## Sci 404 - Cooperative Education/Internship (1-12)

(Credit to be arranged.)

## Sci 405 - Reading and Conference (1-8)

(Credit to be arranged.)

## Sci 407 -Seminar (1-8)

(Credit to be arranged.)

## Sci 409 - Practicum(1-12)

(Credit to be arranged.)

## Sci 410 -Selected Topics (1-8)

(Credit to be arranged.)

## Sci 415 - Understanding the Next Generation Science Standards: Energy and Matter (4)

This course will provide current and future teachers with the science content knowledge they will need to teach science as presented in the Next Generation Science Standards (NGSS) at the elementary level. . The course will be conducted through an integrated program of short lectures, labs, and student projects.
Also offered for graduate-level credit as Sci 515 and may be taken only once for credit. .Prerequisite: upper-division standing.

## Sci 416 - Understanding the Next Generation Science

 Standards: Change Over Time (4)This course will provide current and future teachers with the science content knowledge they will need to teach science as presented in the Next Generation Science Standards (NGSS) at the elementary level. . The course will be conducted through an integrated program of short lectures, labs, and student projects.
Also offered for graduate-level credit as Sci 516 and may be taken only onceforcredit. .Prerequisite: upper-division standing.

## Sci 417 - Understanding the Next Generation Science Standards : Interactions and Systems (4)

This course will provide current and future teachers with the science contentknowledge they will need to teach science as presented in the Next Generation Science Standards (NGSS) at the elementary level. . The course will be conducted through an integrated program of short lectures, labs, and student projects.
Also offered for graduate-level credit as Sci517 and may be taken only once forcredit. .Prerequisite: upper-division standing.

## Sci 501 -Research (1-8)

(Credit to be arranged.)

## Sci 502 - Independent Study (1-8)

(Credit to be arranged.)

## Sci 503 -Thesis (1-12)

(Credit to be arranged.)

## Sci 504-Cooperative Education/Internship (1-12)

(Credit to be arranged.)

## Sci 505 -Reading and Conference (1-8)

(Credit to be arranged.)

## Sci 506 -Special Projects (1-12)

(Credit to be arranged.)

## Sci 507 -Seminar (1-8)

(Credit to be arranged.)

## Sci 508 -Workshop(1-9)

(Credit to be arranged.)

## Sci 509-Practicum(1-12)

(Credit to be arranged.)

## Sci 510 -Selected Topics (0-8)

(Credit to be arranged.)

## Sci 515 -Understanding the Next Generation Science Standards: Energy and Matter (4)

This course will provide current and future teachers with the sciencecontent knowledge they will need to teach science as presented in the Next Generation Science Standards (NGSS) at the elementary level. . The course will be conducted through an integrated program of short lectures, labs, and student projects.
Also offered for undergraduate-level credit as Sci 415 and may be taken only once for credit. . Prerequisite: upperdivision standing.

## Sci 516 -Understanding the Next Generation Science Standards: Change Over Time (4)

This course will provide current and future teachers with the sciencecontent knowledge they will need to teach science as presented in the Next Generation Science Standards (NGSS) at the elementary level. . The course will be conducted through an integrated program of short lectures, labs, and student projects.
Also offered for undergraduate-level credit as Sci 416 and may be taken only once for credit. .Prerequisite: upperdivision standing.

Sci 517 - Understanding the Next Generation Science Standards : Interactions and Systems (4)

This course will provide current and future teachers with the sciencecontent knowledge they will need to teach science as presented in the Next Generation Science Standards (NGSS) at the elementary level. . The course will be conducted through an integrated programof short lectures, labs, and student projects.
Also offered for undergraduate-levelcredit as Sci 417 and may be taken only once for credit. . Prerequisite: upperdivision standing.

## Sci 808 - Workshop(1-12)

CSE offers a number of credit-based professional development opportunities for existing science teachers. These courses are taught by CSE faculty and community partners and cover a wide range of environmental and science education topics. Credits earned through these courses do not fulfill graduate programcredit requirements.

## Sci 810 -Special Topics (1-12)

CSE offers a number of credit-based professional development opportunities for existing science teachers. These courses are taught by CSE faculty and community partners and cover a wide range of environmental and science education topics. Credits earned through these courses do not fulfill graduate programcredit requirements.

## Sc - Science: General

Sc 601 - Research (1-9)
(Credit to be arranged.)

## Sc 602 - Independent Study (1-9)

(Credit to be arranged.)

## Sc 603 - Thesis (1-9)

(Credit to be arranged.)

## Sc 604 - Cooperative Education/Internship (1-9)

(Credit to be arranged.)

## Sc 605 - Reading and Conference (1-9)

(Credit to be arranged.)

## Sc 606 - Special Problems/Projects (1-9)

(Credit to be arranged.)

## Sc 607 - Seminar (1-9)

(Credit to be arranged.)

## Sc 608 - Workshop (1-9)

(Credit to be arranged.)

Sc 609 - Practicum (1-9)
(Credit to be arranged.)

## Sc 610 -Selected Topics (1-9)

(Credit to be arranged.)

## Soc - Sociology

Soc 199 -Special Studies (0-9)
Recommended prerequisite: consent of instructor. Maximum: 8 credits .

## Soc 200 - Introduction to Sociology (4)

Sociological concepts and perspectives concerning human groups; includes attention to socialization, culture, institutions, stratification, and societies. Consideration of fundamental concepts and research methodology.

## Soc 250 - Introduction to Sociology for the Health Sciences (4) <br> Provides a comprehensive overview of sociological concepts that are important to the health sciences.

## Soc 299 -Special Studies (1-8)

(Credit to be arranged.)

## Soc 300 - Foundations of Sociology I (4)

Examination and comparis on of modes of sociological thinking, from the emergence of a distinctive sociological pers pective through sociologicaltheory of the midtwentieth century. Recommended: Soc 200.

## Soc 301 - Classical Sociological Theory (4)

Examination and comparis on of modes of sociological thinking, from the emergence of a distinctive sociological perspective through sociological theory of the midtwentieth century. Recommended: Soc 200.

## Soc 302 - Contemporary Sociological Theory (4)

Developments in American sociological theory frommidtwentieth century to today. Considers impact of social change and social movements on theory, including neoMarxism, feminism, post-modernismand current new directions.

Prerequisite: Soc 301.

## Soc 310 - U.S. Society (4)

Examination of the social structure, culture, and demography of the United States. Sociological approaches to such institutions as the economy, religion, education, and the family are explored. Attention given to comparison with other industrialized countries as well as to selected social issues and controversies. Recommended prerequisites: Soc 200, 301, 302.

## Soc 314U- Alcohol and Other Drugs (4)

Sociological analysis of the behavior and belief patterns relative to alcohol and other drugs in American society. Prevention and intervention strategies are briefly reviewed.

## Soc 320U- Globalization (4)

Exploration of issues and approaches in sociological thinking relative to world systems. World systems are treated notonly as world orders made up of political and economic exchanges, butalso as culturalorders and institutionalized structures transcending national geographic boundaries. Attention given to the international, national, regional, and local ways that people attempt to deal with the instabilities accompanying globalization. Expected preparation: Soc 200, Soc 301, Soc 302.

## Soc 330 -Sociology of Food Inequalities (4)

Examination of food and nutrition is sues and problems through the lens of the social sciences, with an emphasis on inequalities in the production, distribution and consumption of food. Economic, social, political and symbolic dimensions of food systems and food behaviors. Social determinants of hunger, malnutrition, and obesity.

Exploration of solutions at the local, societal and global level.

## Soc 336U- Social Movements (4)

Formation, dynamics, and outcomes of social movements. Examination of the effects of circumstances, strategies, and alliances on the outcomes of social movements, including their impact on politics and society.

## Soc 337U - Prejudice, Privilege, andPower (4)

Examines the structuring of relationships between dominant and minority groups, including racial, ethnic, gender, religious, and cultural minorities, with primary emphas is on U.S. society. Covers basic concepts and theoretical approaches to thestudy of majority-minority group relations, including is sues of oppression, privilege, adaptation, and intersectionality. Emphasizes the social construction of difference, as well as the structural and historical roots of dominant group privilege and unequal social, economic, and political power.

## Soc 339U- Marriage and Intimacy (4)

Introduction to sociological and social psychological perspectives on intimate relationships, marriage, and diverse family forms. Examination of the effects of historical and current social contexts and the role of gender, race, and class in shaping personal choices and experiences. Emphas is is on sociological theory and research.

## Soc 341U- Population Trends and Policy (4)

Introduction to the general field of population analysis; a review of the development of population theories, techniques of meas urement and analysis of the basic demographic variables, their interrelationships, and population changes. Recommended prerequis ites: Soc 200.

## Soc 342 -Social Psychology: Self, Attitudes and Social Influence (4)

Examination of psychological and sociological processes as sociated with people's thoughts about and interactions with one another. Particularemphases on self, social identity, social cognition, attitudes, prejudice and persuasion. Expected preparation: Soc 200, or Psy 200 or 204. Credit will not be given for both Soc 342 and Psy 342.

## Soc 343 -Social Psychology: Social Relationships and Groups (4)

Examination of sociological and psychological processes as sociated with interpersonal, group, and inter-group behavior. Particular emphases on aggression, pro-social behavior, interpersonal attraction, group influence, conflict and cooperation. Expected preparation: Soc 200, or Psy 200 or 204. Credit will not be given for both Soc 343 and Psy 343.

## Soc 344U- Gender and Sexualities (4)

Examines the ways in which social constructions of gender both influence and are influenced by the cultural org anization of and individual expres sions of sexuality. The courseexplores the intersections among sexuality, culture, gender, and the body and examines a variety of sexualities and emphasizes the multifaceted nature of power, privilege, and oppression.

## Soc 350U- Coming of Age: Adulthood in the US, Europe, and Asia (4)

An examination of changes in life-course in the US, Scandinavia, Southern Europe, and Japan focusing on the impact of globalization, gender, race and class on key lifetransitions (leaving home, education, work, partnering, and having children)

## Soc 370 -Sociology of Deviancy (4)

Introduction and analysis of deviant behavior. Delineation of the sociological and social ps ychological factors which give rise to deviant roles. Recommended prerequisites: Soc 200.

## Soc 376 -Social Change (4)

Deals with the technological and ideological factors which govern theevolution and transformation of society, with specialemphasis on the operation of such factors since 1800. Recommended prerequisites: Soc 200.

## Soc 380U-S ports in Society (4)

An objectiveexamination of sports in America as social phenomena. Study of various socio-cultural structures, patterns, and organizations or groups in volved with sports. Issues such as race, gender, and class within the context of sports will be explored through a critical sociological lens.

## Soc 396 - Social Research Methods, Social Statistics (4)

Introduction to the range of techniques for analy zing social science data. Emphasis on the conceptualization, operationalization, and measurement of socially based phenomena. Topics include: level of measurement, operationalization, summary statistics, probability, hypothesis tests, and the useof data analysis software (SPSS).

## Soc 397 -Social Research Methods (5)

Study of the structuring of sociological inquiry, conceptualization and measurement, operationalization, computers in social research, analysis of bivariate and multivariate relations, the logic of sampling and inference. Course includes lecture (4hours per week) and an introductory research laboratory ( 2 hours per week).
Prerequisite: Stat 243. Expected preparation: Soc 200, 301, 302.

## Soc 397L - Social Research Methods Lab (0)

Lab for Soc 397.
Corequisite: Soc 397.

## Soc 398 - Sociology Res earch Project (4)

Development and execution of a research project integrating some aspect of sociological theory with social science research methodology. Students work in teams to identify a research problem, design and conduct research bearing on this problem, and write a research report. Soc 397 and 398 are to be taken as a two-termsequence.

## Soc 399 - Special Studies (1-6)

(Credit to be arranged.)

## Soc 399U- Special Studies (4)

(Credit to be arranged.)

## Soc 401 - Research (1-6)

(Credit to be arranged.) Consent of instructor.

## Soc 402 - Independent Study (1-8)

(Credit to be arranged.)

## Soc 403 - Thesis (1-4)

(Credit to be arranged.)

## Soc 404 -Cooperative Education/Internship (1-12)

(Credit to be arranged.)

## Soc 405 -Reading and Conference (1-6)

(Credit to be arranged.) Consent of instructor.

## Soc 407 -Seminar (1-6)

(Credit to be arranged.) Consent of instructor.

## Soc 408-Workshop(1-12)

(Credit to be arranged.)

## Soc 410 -Selected Topics (1-9)

(Credit to be arranged.) Maximum: 12 credits. Consent of instructor.

## Soc 417 -Law \& Society: The Sociology of Law (4)

Examination of different sociological and sociolegal theories and empirical research on the social origins, processes, functions, and actors of the social reality known as law. Consideration of law as a social institution that shapes and is shaped by society, including how law reinforces and/or ameliorates class, gender, and racial inequalities as well as fundamental issues such as free speech and privacy.
Prerequisite: Soc 200.

## Soc 418 - Criminology and Delinquency (4)

Social and legal meaning of crime and delinquency explored. Historical and contemporary theories of causes of law breaking reviewed. Social and cultural factors promoting and inhibiting law breaking by juveniles and adults are examined. Attention given to strategies of prevention and control. Expected preparation: Soc 200.
Also offered for graduate-level credit as Soc 518 and may be taken only once forcredit. .

## Soc 419 -Sociology of Mental IIIness (4)

An overview of sociological perspectives on mental health and illness. Informs understanding of mentalhealth and illness by challenging dominant views of mental illness, examining how social relationships play a role in mental illness, questioning the goals and implications of mental health policy and presenting research on how mental health services are organized and provided.

Also offered for graduate-level credit as Soc 519 and may be taken only once for credit. .Prerequisite: Soc 200.

## Soc 420 - Urbanization and Community (4)

Analytical approach to the meaning of community in the modern world. The determinants, social consequences of, and responses to the processes of urbanization are considered. Theories of the city emphasizing ecological, sociocultural, and critical explanations for growth and change in urban regions are examined. Patterns of social and structural org anization of the metropolis and the cognitive and behavioral aspects of urban life are explored. Expected preparation: Soc 200.
Also offered for graduate-level credit as Soc 520 and may be taken only once for credit. .

## Soc 423 - Stratification (4)

Survey and analy sis of stratification theories and empirical research. Analysis of class, race, ethnicity, gender, and sexual orientation, considering economic, social, political, and cultural dimensions of power. Expected preparation: Soc 200.
Also offered for graduate-level credit as Soc 523 and may be taken only once for credit. .

## Soc 424 - Groups, Interaction and Identity (4)

Analysis of the formation and functioning of intergroup and intragroup relations. Attention to group org anization and interaction, performance, cooperation, conflict, and group membership and individual identity. Expected preparation: Soc orPsy 342.
Also offered for graduate-level credit as Soc 524 and may be taken only once for credit. . Prerequisite: Soc 200.

## Soc 425 -Sociology of Gender (4)

Consideration of the theoretical, methodological, and empirical contributions of current sociological scholarship on gender. Emphasis on the intersection of gender, sexuality, race/ethnicity, and class. Analysis of topics such as: masculinity/femininity, parenting, family, education, work, sexualities, reproduction, politics, and social change. This is the same course as WS 425 and may be taken only once for credit.

Also offered for graduate-level credit as Soc 525 and may be taken only once forcredit. . Prerequisite: junior standing. Cross-Listed as: WS 425.

## Soc 426 - Gender \& Mental Health (4)

Social and historical explanations of, and researchon, mentalillness and mental health, with a focus on gender. Contemporary distributions, diagnoses, and treatments of mental illness among men and women are examined. Focus on psychiatric dis order and gender-based discourse. This is the same course as WS 426 and may be taken only once for credit.

Also offered for graduate-level credit as Soc 526 and may be taken only once forcredit. Prerequisite: Upper-division standing. Cross-Listed as: WS 426.

## Soc 427 - Gender and Work (4)

Consideration of the theoretical, methodological, and empirical contributions of current scholarship in the area of gender and work. Emphas is on the intersection of gender, sexuality, race/ethnicity, and class. Topics include: inequalities in the labor force, low wage work and poverty, work/family conflict, sex/sexuality in the workplace, and masculinity.

Also offered for graduate-level credit as Soc 527 and may be taken only once forcredit.

## Soc 430 - Hate Crimes (4)

Hate crimes as a social issue. Central themes: the role that gender plays in the commis sion and awareness of hate crimes and the mainstreaming of bias crimes and the ideology behind them. Includes analy sis of propaganda and coded language in the popular media and the Internet, analys is of the grass-roots response in the popular media, and evaluation of their effectiveness.
Also offered for graduate-level credit as Soc 530 and may be taken only once for credit. . Prerequisite: Soc 200.

## Soc 441 -Population and Society (4)

Survey and analysis of population dynamics (births, deaths, migration) and society. Examination of demographic concepts, theories, data and measurements, and research. Role of population processes on social life and public policies are highlighted, including population aging, economic development and the en vironment, urbanization, health and health care, race and ethnicity, and government/social/business planning. This course is the same as USP 419/USP 519; course may be taken only once for credit.

Also offered for graduate-level credit as Soc 541 and may be taken only once forcredit. .Prerequisite: Soc 200. Cross-Listed as: USP 419.

## Soc 444 - Race, Ethnicity, and Nationality (4)

Analysis of the emergence, persistence and meaning of definitions of racial, ethnic and national statuses in selected areas of the modern world. Consideration of the consequences of changing definitions for intergroup and globalrelations. Expected preparation: Soc 200.
Also offered for graduate-level credit as Soc 544 and may be taken only once for credit. .

## Soc 446 - Immigrants in America (4)

Exploration of controversial issues around immigration to the U.S. Students will read and discuss social science research on demographics of immigrants, immigration
policy, immigrant incorporation, and the impact of immigration on the receiving society.

Prerequisite: Soc 200 or Soc 337 U .

## Soc 448 -Sociology of Education (4)

Development of a sociological understanding of education in the United States. Examination the role of schooling in regards to the larger society, the social structure of schools, processes of social mobility, stratification and social reproduction; the dynamics of race, class, and gender inequalities in education, student teacher relationship; school choice; and the outcomes of education. Expected preparation: Soc 200.
Also offered for graduate-level credit as Soc 548 and may be taken only once for credit. . Prerequisite:Soc 300 .

## Soc 450 -Sociology of Higher Education (4)

Social factors affecting individuals within higher education. Particular attention to inequalities within higher education and the role higher education plays in promoting social mobility as well as social reproduction. Includes models of higher education, the application of sociological theories to is sues in higher education, access to college, Affirmative Action, standardized testing, andclass, race, and gender-based differences in individual educational outcomes and retention.
Also offered for graduate-level credit as Soc 550 and may be taken only once for credit. . Prerequisite: sophomore standing or higher; Soc 200.

## Soc 452 - Education and Equality: Comparing the US, Asia, Europe (4)

Despite the promise of equal opportunity, US public schools produce vast inequalities in educational outcomes compared to other nations. Why? Thecourse examines the impacts of tracking, testing, teaching styles, race, class, and gender in the US through comparisons of Japan, Singapore, Germany, and Finland.
Also offered for graduate-level credit as Soc 552 and may be taken only once for credit. . Prerequisite: Soc 200, Soc 310 , or Soc 320.

## Soc 454 -Sociology through Film (4)

Filmmakers, like sociological fieldworkers, use stories to trace the action of their subjects or characters and scenes to reconstruct their shared social worlds. Through sociological studies and documentary and narrative films, the course examines portrayals of social institutions and processes which may include education, ethnic relations, artistic production, and otherfields.
Also offered for graduate-level credit as Soc 554 and may be taken only oncefor credit. . Prerequisite: Soc 200, Soc 310 , or Soc 320.

## Soc 456 -Sociology of Horror Films (4)

Examines core tenets of sociology through the use of horror films. Explores how gender, sexuality, race, and other forms of oppression are embedded in classic and contemporary horror films. Drawing on feminist theories, sociology of race and ethnicity, students learn to critically analyze horror films, while also conducting an independent content analy sis res earch project.
Prerequisite: Upper-division standing.

## Soc 457 - Complex Organizations (4)

Examination of complex organizations both as formal structures and as cultural systems. Analysis of the relations between organizations and individuals of interorg anizational dynamics and of the rationalization of modern societies. Expected preparation: Soc 200.

Also offered for graduate-level credit as Soc 557 and may be taken only once for credit. .

## Soc 459 -Sociology of Health and Medicine (4)

The application of sociology to the field of health and medicine. Attention given to a consideration of the broader questions of health in modern society, including the role of the medical practitioner in modern society, social factors and disease and responses to illness. The social organization of medicine is examined within the context of the larger medical care system. Recommended prerequisite: Soc 200.

## Soc 460 - Youth Subcultures (4)

Youth as crisis and in cris is. Focus on methodology, ethnomethodology, and field experience; students will create ethnographs. Examination of the science of semiotics to understand subcultural style as language. Expected preparation: Soc 397.
Also offered for graduate-level credit as Soc 560 and may be taken only once for credit. .Prerequisite: Soc 200. .

## Soc 461 -Sociology of the Family (4)

Sociological analysis of the structure and functions of the family institution and its relationship to external systems such as the economy and polity. Changing and diverse forms of family organization in urban society. Analysis of role relations in the family. Expected preparation: Soc 200.
Also offered for graduate-level credit as Soc 561 and may be taken only once for credit. .

## Soc 462 -Sociology of Integrative Medicine (4)

An examination of common systems and practices understood as complementary and alternative medicine (CAM) including prevalence, patterns of use, trends, consumer health beliefs and motivations, and integration with mainstreamallopathic medicine; philosophical,
historical and political dimensions; theories of health and illness; evidence-based research vs.traditional and folk beliefs; and a consideration of benefits and limitations considering the growing popularity. Not a course about how to practice any form of alternative medicine. Expected preparation: Soc 200.

Also offered for graduate-level credit as Soc 562 and may be taken only once for credit. .

## Soc 463 - Global Inequalities and Health (4)

An examination of international health inequalities from social, political and economic perspectives. The impact of globalization, transnationalismand migration on population health. Inequalities within and between countries and regions, and the social dy namics that shape those inequalities. Infectious pandemics and chronic diseases, and global efforts to control diseases and improve health. Recommended prerequisites: Soc 200.

## Soc 465 - Environmental Sociology (4)

Survey and analysis of the types of social forces which frame the nature of environmental problems concerning natural resource use and distribution as they emerge in public consciousness within the United States and globally. Examination of the socialforces which lead to the consideration and implementation of mechanisms to solve these is sues once they have emerged.

## Soc 466 - Sociology of Dying and Death (4)

This course will explore the nature of dying and death in the U.S. Topics will include: where death occurs, how social policy affects theexperience of dying, how medical pers pectives affect the experience of dying, how death affects family members, and race, class, gender differences in dying and death.
Also offered for graduate-level credit as Soc 566 and may be taken only once for credit. Prerequisite: Upper-division standing.

## Soc 468 - Political Sociology (4)

Analysis of consensus and dis sensus in community and society. Examination of public opinion, authority, influence, and the processes by which elites are formed and acquire legitimacy and popular support. Social bases of democracy and totalitarianism. Recommended prerequisite: Soc 200.

## Soc 469 - Sociology of Aging (4)

A study of social determinants of the human life course, including biological and demographic conditions, age status patterns, age grading, rites of passage, socialization,
generational phenomena, and youth and old age movements. Expected preparation: Soc 200.

Also offered for graduate-level credit as Soc 569 and may be taken only once for credit. .

## Soc 480 -Sociology of Religion (4)

Analysis of the nature of the sacred; attitudes toward the sacred in contrast to the secular. Comparison of the social organization of sect and church in their relation to the larger society. Survey of recent empirical studies of religiosity and religious practices in America. New trends in American religion. Expected preparation: Soc 200.
Also offered for graduate-level credit as Soc 580 and may be taken only once forcredit. .

## Soc 483 - Sociology of the Middle East (4)

This course will examine the sociological development of the modern Middle East. It will especially focus on causes and consequences of rapid social change, including revolutions, coups, and ins urgent movements. It will examine the role of Is lam and tribalismin these movements. Expected preparation: Soc 200.
Also offered for graduate-level credit as Soc 583 and may be taken only once for credit. .

## Soc 497 - Applied Survey Research (4)

Provides theoretical framework for and experience in design, execution, and interpretation of social surveys including sampling procedures, questionnaire design, interviewing techniques, coding and computer analysis, and report writing. Expected preparation: Stat 243 and Soc 397, Soc 398 or equivalent.
Also offered for graduate-level credit as Soc 597 and may be taken only once for credit. .

Soc 501 - Research (1-9)
(Credit to be arranged.) Consent of instructor.

## 502 - Independent Study (1-9)

(Credit to be arranged.)

## Soc 503 - Thesis (1-9)

(Credit to be arranged.) Pas s/no pass option.

## Soc 504 - Cooperative Education/Internship (1-9)

(Credit to be arranged.)

## Soc 505 - Reading and Conference (1-6)

(Credit to be arranged.) Consent of instructor.

## Soc 507 -Seminar (1-6)

(Credit to be arranged.) Consent of instructor.

## Soc 509 - Practicum(1-9)

(Credit to be arranged.)

## Soc 510 -Selected Topics (1-9)

(Credit to be arranged.) Maximum: 12 credits. Consent of instructor.

## Soc 513 - Thesis Workshop (1)

Workshop for all sociology graduate students who are currently enrolled in Soc 503 for four credits or more. Discussion and review of students' progress and problems. Recommended prerequisite: graduate status in sociology. Corequisite: Soc 503. Pas s/nopass only.

## Soc 518 - Criminology and Delinquency (4)

Social and legal meaning of crime and delinquency explored. Historical and contemporary theories of causes of law breaking reviewed. Social and cultural factors promoting and inhibiting law breaking by juveniles and adults are examined. Attention given to strategies of prevention and control. Expected preparation: Soc 200.

Also offered for undergraduate-level credit as Soc 418 and may be taken only once for credit. .

## Soc 519 - Sociology of Mental Illness (4)

An overview of sociological perspectives on mental health and illness. Informs understanding of mental health and illness by challenging dominant views of mental illness, examining how social relationships play a role in mental illness, questioning the goals and implications of mental health policy and presenting research on how mental health services are organized and provided.
Also offered for undergraduate-level credit as Soc 419 and may be taken only once for credit. . Prerequisite: Soc 200.

## Soc 520 - Urbanization and Community (4)

Analytical approach to the meaning of community in the modern world. The determinants, social consequences of, and responses to the processes of urbanization are considered. Theories of the city emphasizing ecological, sociocultural, and criticalexplanations for growth and
change in urban regions are examined. Patterns of social and structural organization of the metropolis and the cognitive and behavioral as pects of urban life are explored. Expected preparation: Soc 200.
Also offered for undergraduate-level credit as Soc 420 and may be taken only once for credit. .

## Soc 523 -Stratification (4)

Survey and analysis of stratification theories and empirical research. Analysis of class, race, ethnicity, gender, and sexual orientation, considering economic, social, political, and cultural dimensions of power. Recommended prerequisite: Soc 200.
Also offered for undergraduate-levelcredit as Soc 423 and may be taken only once for credit. .

## Soc 524 - Groups, Interaction and Identity (4)

Analysis of the formation and functioning of intergroup and intragroup relations. Attention to group organization and interaction, performance, cooperation, conflict, and group membership and individualidentity. Analysis of the formation and functioning of intergroup and intragroup relations. Attention to group organization and interaction, performance, cooperation, conflict, and group membership and individual identity. Expected preparation: Soc or Psy 342.

Also offered for undergraduate-level credit as Soc 424 and may be taken only once for credit. . Prerequisite: Soc 200.

## Soc 525 -Sociology of Gender (4)

Consideration of the theoretical, methodological, and empirical contributions of current sociological scholarship on gender. Emphasis on the intersection of gender, sexuality, race/ethnicity, and class. Analysis of topics such as: masculinity/femininity, parenting, family, education, work, sexualities, reproduction, politics, and social change. This is the same course as WS 525 and may be taken only once forcredit.

Also offered for undergraduate-levelcredit as Soc 425 and may be taken only once for credit. . Prerequisite: junior standing. Cross-Listed as: WS 525.

## Soc 526 - Gender \& Mental Health (4)

Social and historical explanations of, and research on, mental illness and mental health, with a focus on gender. Contemporary distributions, diagnoses, and treatments of mentalillness among men and women are examined.
Focus on psychiatric dis order and gender-based discourse. This is the same course as WS 526 and may be taken only once forcredit.
Also offered for undergraduate-level credit as Soc 426 and may be taken only once for credit. Cross-Listed as:WS 526.

## Soc 527 - Gender and Work (4)

Consideration of the theoretical, methodological, and empirical contributions of current scholarship in the area of gender and work. Emphas is on the intersection of gender, sexuality, race/ethnicity, and class. Topics include: inequalities in the labor force, low wage work and poverty, work/family conflict, sex/sexuality in the workplace, and masculinity.
Also offered for undergraduate-level credit as Soc 427 and may be taken only once for credit.

## Soc 528 - Gender Inequality (4)

Explore sociological scholarship on topics related to gender inequality. Emphas is on examining the intersection of gender with race, ethnicity, class, and sexuality. Major focus will be evaluating the theoretical, methodological, and empirical contributions of scholarship in the area of gender inequality.
Also offered as Soc 628 and may be taken only oncefor credit.

## Soc 530 - Hate Crimes (4)

Hate crimes as a social issue. Central themes: the role that gender plays in the commission and awareness of hate crimes and the mainstreaming of bias crimes and the ideology behind them. Includes analy sis of propaganda and coded language in the popular media and the Internet, analys is of the grass-roots res ponse in the popular media, and evaluation of their effectiveness.

Also offered for undergraduate-level credit as Soc 430 and may be taken only once for credit. . Prerequisite: Soc 200.

## Soc 537 -Qualitative Data Analysis (4)

Introduction to three techniques for analyzing qualitative data: software-based analysis using ATLAS.ti, Grounded Theory, and Thematic Analysis. Practical orientation, emphasizing hands-on experience with these techniques. Most usefulfor students engaged in data collection.

Also offered as Soc 637 and may be taken only oncefor credit. Prerequisite: Soc 592.

## Soc 538 - Integrating Qualitative and Quantitative Methods (4)

Research designs for combining qualitative and quantitative methods thathavereasonably well-understood benefits, and can be implemented in a relatively straightforward fashion. The value of pragmatis mas a philosophical paradigmfor doing mixed methods research will also be considered.

Also offered as Soc 638 and may be taken only once for credit.

## Soc 539 - Focus Groups Interviewing (4)

A practically oriented course which teaches the methods of conducting researchusing focus groups. Course will follow the steps involved in conducting a res earch project that uses focus groups. Related methods, dyadic interviewing, and hands on training are at the center of this course.

Also offered as Soc 639 and may be taken only oncefor credit.

## Soc 541 - Population and Society (4)

Survey and analysis of population dy namics (births, deaths, migration) and society. Examination of demographic concepts, theories, data and measurements, and research. Role of population processes on social life and public policies are highlighted, including population aging, economic development and the environment, urbanization, health and health care, race and ethnicity, and government/social/business planning. This course is the same as course as USP 519 and may be taken only once for credit.
Also offered for undergraduate-levelcredit as Soc 441 and may be taken only once for credit. . Prerequisite: Soc 200. Cross-Listed as: USP 519.

## Soc 544 - Race, Ethnicity, and Nationality (4)

Analysis of the emergence, persistence and meaning of definitions of racial, ethnic and national statuses in selected areas of the modern world. Consideration of the consequences of changing definitions for intergroup and global relations. Expected preparation: Soc 200.
Also offered for undergraduate-levelcredit as Soc 444 and may be taken only once for credit. .

## Soc 548 -Sociology of Education (4)

Development of a sociological understanding of education in the United States. Examination the role of schooling in regards to the larger society, the social structure of schools, processes of social mobility, stratification and social reproduction; the dynamics of race, class, and gender inequalities in education, student teacher relationship; school choice; and the outcomes of education.

Also offered for undergraduate-level credit as Soc 448 and may be taken only once for credit. . Prerequisite: Soc 300. Expected preparation: Soc 200.

## Soc 550 -Sociology of Higher Education (4)

Social factors affecting individuals within higher education. Particular attention to inequalities within higher education and the role higher education plays in promoting social mobility as well as social reproduction. Includes models of higher education, the application of sociological theories to is sues in higher education, access to college, Affirmative Action, standardized testing, and clas s, race,
and gender-based differences in individualeducational outcomes and retention.

Also offered for undergraduate-level credit as Soc 450 and may be taken only once for credit. . Prerequisite: sophomore standing or higher; Soc 200.

## Soc 552 - Education and Equality: Comparing the US, Asia, Europe (4)

Despite the promise of equal opportunity, US public schools produce vast inequalities in educational outcomes compared to other nations. Why? Thecourse examines the impacts of tracking, testing, teaching styles, race, class, and gender in the US through comparisons of Japan, Singapore, Germany, and Finland.
Also offered for undergraduate-level credit as Soc 452 and may be taken only once for credit. . Prerequisite: Soc 200, Soc 310, or Soc 320.

## Soc 554 -Sociology through Film (4)

Filmmakers, like sociological fieldworkers, use stories to trace the action of their subjects or characters and scenes to reconstruct their shared social worlds. Through sociological studies and documentary and narrative films, the course examines portrayals of social institutions and processes which may include education, ethnic relations, artistic production, and other fields.

Also offered for undergraduate-level credit as Soc 454 and may be taken only once for credit. Prerequisite: Soc 200, Soc 310, or Soc 320.

## Soc 557 - Complex Organizations (4)

Examination of complex organizations both as formal structures and as cultural systems. Analysis of the relations between organizations and individuals of interorg anizational dy namics and of the rationalization of modern societies. Expected preparation: Soc 200.
Also offered for undergraduate-level credit as Soc 457 and may be taken only once for credit. .

Soc 560 - Youth Subcultures (4)
Youth as cris is and in cris is. Focus on methodology, ethnomethodology, and field experience; students will create ethnographs. Examination of the science of semiotics to understand subcultural style as language. Expected preparation: Soc 397.
Also offered for undergraduate-level credit as Soc 460 and may be taken only once for credit. . Prerequisite: Soc 200. .
Soc 561 -Sociology of the Family (4)
Sociological analysis of the structure and functions of the family institution and its relationship to external systems such as the economy and polity. Changing and diverse forms of family organization in urban society. Analysis of role relations in the family. Expected preparation: Soc 200.

Also offered for undergraduate-levelcredit as Soc 461 and may be taken only once for credit. .

## Soc 562 -Sociology of Integrative Medicine (4)

An examination of common systems and practices understood as complementary and alternative medicine (CAM) including prevalence, patterns of use, trends, consumer health beliefs and motivations, and integration with mainstreamallopathic medicine; philosophical, historical and political dimensions; theories of health and illness; evidence-based research vs. traditional and folk beliefs; and a consideration of benefits and limitations considering the growing popularity. Not a course about how to practice any form of alternative medicine. Recommended: Soc 200.

Also offered for undergraduate-level credit as Soc 462 and may be taken only once for credit. .

## Soc 565 -Environmental Sociology (4)

Analysis of the types of social forces which frame the nature of environmental problems concerning resource use and distribution across spatial and geopoliticallevels. Examines the social forces which influence which problems are tackled; the mechanisms selected to solve the problems; and the social impact of the selected solutions. Expected preparation: undergraduate exposure to basic social science concepts.
Also offered as Soc 665 and may be taken only once for credit. .

## Soc 566 -Sociology of Dying and Death (4)

This course will explore the nature of dying and death in the U.S. Topics will include: where death occurs, how social policy affects theexperience of dying, how medical perspectives affect the experience of dying, how death affects family members, and race, class, gender differences in dying and death.
Also offered for undergraduate-level credit as Soc 466 and may be taken only once for credit.

## Soc 569 -S ociology of Aging (4)

A study of social determinants of the human life course, including biological and demographic conditions, age status patterns, age grading, rites of passage, socialization, generational phenomena, and youth and old age movements. Expected preparation: Soc 200.
Also offered for undergraduate-levelcredit as Soc 469 and may be taken only once for credit. .

## Soc 572 -Contemporary Sociological Theory (4)

Study of various frames of reference in contemporary sociological theory. Specific topics vary with instructor. Recommended prerequisites: Soc 200, 301, 302; senior standing.

## Soc 576 - Theories of Social Change (3)

A critical examination of the major theories of social change. Analy sis of the components of change; cause, agents, targets, channels, and strategies. Consideration of the relationship between change and power, influence, planning and control, modernization, development, and world systems approaches. Recommended prerequisite: graduate status.

## Soc 577 - Topics in Contemporary Theory (4)

Exploration of theoretical approaches and is sues of emerging interest in sociology, such as conceptualization of social systems, conflict, the problems of relativity, and ideology. Specific topics vary with ins tructor. Recommended prerequisite: $\operatorname{Soc} 301,302$ and graduate status.

## Soc 579 - Food, Justice, and Social Movements (4)

This seminar examines growing social movements around food and agriculture. Includes theoretical and conceptual frameworks for understanding historical and current dynamics in the global food and agriculture system, and debates over land grabs, food price crises, hunger, and the role of biotechnology, agribusiness, and low-input peasant agriculture. Case studies examine social movements around land and food in the global South and North. Concludes with alternative models and emerging paradigms, including food sovereignty and food justice.
Also offered as Soc 679 and may be taken only oncefor credit.

## Soc 580 - Sociology of Religion (4)

Analysis of the nature of the sacred; attitudes toward the sacred in contrast to the secular. Comparis on of the social organization of sect and church in their relation to the larger society. Survey of recent empirical studies of religiosity and religious practices in America. New trends in American religion. Expected preparation: Soc 200.
Also offered for undergraduate-level credit as Soc 480 and may be taken only once for credit. .

## Soc 583 - Sociology of the Middle East (4)

This course will examine the sociological development of the modern Middle East. It will especially focus on causes and consequences of rapid social change, including revolutions, coups, and ins urgent movements. It will examine the role of Is lam and tribalismin these movements. Expected preparation: Soc 200.

Also offered for undergraduate-level credit as Soc 483 and may be taken only once for credit. .

## Soc 584 -Social Inequality (4)

Theoretical perspectives and current research in social inequality including dimensions such as social class, race/ethnicity, gender, age, and nativity. Exploration of social inequality in selected domains, such as health services and outcomes, employment and work, educational attainment, housing, and other areas of sociological inquiry.
Also offered as Soc 684 and may be taken only once for credit.

## Soc 585 -Medical Sociology (4)

Seminar in medical sociology. Topics includehow social stratification affects health outcomes, en vironmental hazards, social construction of medical knowledge, health care occupations, U.S. health policy, privatization of medical industries, and comparative health care systems. Expected preparation: Soc 459/Soc 559 or consent of instructor.

Also offered as Soc 685 and may be taken only oncefor credit. .

## Soc 586 - Topics in Health and Inequality (4)

Seminar focusing on the impact of race, class, and/or gender on health and health care. Topics may inc lude medicalization of women's bodies, the social consequences of disparities, and current public policy debates about reducing disparities. Expected preparation: Soc 459/559.
Also offered as Soc 686 and may be taken only oncefor credit. .

## Soc 587 - International Health Inequalities (4)

Explores the sociology of health and inequality in an international context. Topics include international health institutions, healthcare systems, and the social determinants of health inequalities in a global perspective.
Also offered as Soc 687 and may be taken only once for credit.

## Soc 588 -Social Sustainability Theory and Practice (4)

Healthy families; healthy communities; healthy democracies; economic, gender and racial equity; and social justice are all factors of social sustainability. This course will examine how to meas ure and how to reach these goals, by examining models locally, nationally and internationally. We will look at best practices of city, state and national governments, businesses, unions, and NGOs . We will also examine the relationship between economic, environmental and social sustainability.
Also offered as Soc 688 and may be taken only oncefor credit.

## Soc 590 - Social Res earch Strategies (4)

Consideration of the nature of sociological knowledge; elements of social res earch design; methods of observation and data collection; reliability and validity of information; techniques of data analysis. Recommended prerequisite: graduate status.

## Soc 591 - Theoretical Perspectives in Sociology (4)

Analysis of the major contemporary theories in sociology. Attention to the problems of order and change, and power and inequality, as well as to the micro/macro problemin sociological theory. Recommended prerequisite: Soc 470 and graduate status.

## Soc 592 - Qualitative Methods (4)

Strategies for acquisition and analysis of data using such approaches as participantobservation, content analy sis, field and case studies. Attention to the special problems of validity and reliability in such research. Consideration of ethical is sues and researcher responsibility in qualitative research. Recommended prerequisite: graduate status.

## Soc 593 - Quantitative Methods (4)

The application of quantitative methodology to sociological problems. Topics include: science and logical empiricism; measurement of association; procedures of statistical inference; multivariate and log linear analysis; computer application for social research. Recommended prerequisites: Stat 243 , $\operatorname{Soc} 397,398$, graduate status.

## Soc 594 - Theory Construction and Research (4)

Examination of the craft of sociological research in conjunction with thesis work. The role of theory in research, evaluating published work, biases in data sources and the process of thesis writing. Recommended prerequisites: Soc 590, 591; graduate status.

## Soc 595 - Advanced Quantitative Methods (4)

Introduces a range of advanced quantitative methods commonly found in published research in sociology. Particular attention will be paid to the techniques commonly used to address the most common shortcomings of sociological data, including estimation of multivariate models with categorical dependent variables (i.e. logistic regression) and to nonparametric methods for analyzing data.
Also offered as Soc 695 and may be taken only oncefor credit. Prerequisite: Soc 593, or Stat 543 or equivalent.

## Soc 597 - Applied Survey Research (4)

Provides theoretical framework for and experience in design, execution, and interpretation of social surveys including sampling procedures, questionnaire design, interv iewing techniques, coding and computer analysis, and report writing. Expected preparation: Stat 243 and Soc 397, 398 orequivalent.
Also offered for undergraduate-levelcredit as Soc 497 and may be taken only once for credit. .

## Soc 598 - Globalization Seminar (4)

Analysis of the ways in which economic patterns that reach across national boundaries affect the security of communities and theirstandards of living. Topics include how different economic clas ses fare in the rapid reshuffling of national economies that globalization entails; the role of international institutions in shaping economic globalization; the experience and responses of workers as a group; and the role of states in facilitating or res is ting the adverse impacts of globalization.
Also offered as Soc 698 and may be taken only once for credit.
Soc 601 - Research (0-9)
(Credit to be arranged.)

## Soc 603 -Dissertation (1-9)

(Credit to be arranged.)

## Soc 604 - Cooperative Education/Internship (1-9)

(Credit to be arranged.)

## Soc 605 - Reading and Conference (1-6)

(Credit to be arranged.)

## Soc 607 -Seminar (1-6)

(Credit to be arranged.)

## Soc 610 -Selected Topics (1-9)

(Credit to be arranged.)

## Soc 619 -Sociology of Mental Health \& Mental Illness (4)

The sociological study of mental health and illness is uniquely different from the orientations of other disciplines
in that it focuses on (1) identify ing the social conditions that affect psychological well-being and (2) describing the processes linking the social conditions to their psychologicaleffects. The dual aims of this course are to provide both the theoretical foundations necessary for the study of societal effects on individuals' well-being and a familiarity with relevant sociological research on mental health and mental illnes s.
Prerequis ite: Graduate student status or permis sion of the instructor.

## Soc 628 - Gender Inequality (4)

Explore sociological scholarship on topics related to gender inequality. Emphas is on examining the intersection of gender with race, ethnicity, class, and sexuality. Major focus will be evaluating the theoretical, methodological, and empirical contributions of scholarship in the area of gender inequality.
Also offered as Soc 528 and may be taken only oncefor credit.

## Soc 637 - Qualitative Data Analysis (4)

Introduction to three techniques for analyzing qualitative data: software-based analysis using ATLAS.ti, Grounded Theory, and Thematic Analysis. Practical orientation, emphasizing hands-on experience with these techniques. Most useful for students engaged in data collection.
Also offered as Soc 537 and may be taken only once for credit. Prerequisite: Soc 592.

## Soc 638 - Integrating Qualitative and Quantitative Methods (4)

Research designs for combining qualitative and quantitative methods thathavereasonably well-understood benefits, and can be implemented in a relatively straightforward fas hion. The value of pragmatis mas a philosophical paradigmfor doing mixed methods research will also be considered.
Also offered as Soc 538 and may be taken only oncefor credit.

## Soc 639 - Focus Groups Interviewing (4)

A practically oriented course which teaches the methods of conducting researchusing focus groups. Course will follow the steps involved in conducting a research project that uses focus groups. Related methods, dyadic interviewing, and hands on training are at the center of this course.
Also offered as Soc 539 and may be taken only oncefor credit.

## Soc 665 - Environmental Sociology (4)

Analysis of the types of social forces which frame the nature of environmental problems concerning resource use
and distribution across spatial and geopoliticallevels. Examines the social forces which influence which problems are tackled; the mechanisms selected to solve the problems; and the social impact of the selected solutions. Expected preparation: undergraduate exposure to basic social science concepts.

Also offered as Soc 565 and may be taken only once for credit. .

## Soc 679 - Food, Justice, and Social Movements (4)

This seminar examines growing social movements around food and agriculture. Includes theoretical and conceptual frameworks for understanding historical and current dynamics in the global food and agriculture system, and debates over land grabs, food price crises, hunger, and the role of biotechnology, agribusiness, and low-input peasant agriculture. Case studies examine social movements around land and food in the global South and North. Concludes with alternative models and emerging paradigms, including food sovereignty and food justice.
Also offered as Soc 579 and may be taken only once for credit. Prerequisite: None.

## Soc 684 -Social Inequality (4)

Theoretical pers pectives and current research in social inequality including dimensions such as social class, race/ethnicity, gender, age, and nativity. Exploration of social inequality in selected domains, such as health services and outcomes, employment and work, educational attainment, housing, and other areas of sociological inquiry.
Also offered as Soc 584 and may be taken only once for credit.

## Soc 685 -Medical Sociology (4)

Seminar in medical sociology. Topics includehow social stratification affects health outcomes, en vironmental hazards, social construction of medical knowledge, health care occupations, U.S. health policy, privatization of medical industries, and comparative health care systems. Expected preparation: Soc 459/Soc 559 or consent of instructor.
Also offered as Soc 585 and may be taken only oncefor credit. .

## Soc 686 - Topics in Health and Inequality (4)

Seminar focusing on the impact of race, class, and/or gender on health and health care. Topics may include medicalization of women's bodies, the social consequences of disparities, and current public policy debates about reducing disparities. Expected preparation: Soc 459/Soc 559.

Also offered as Soc 586 and may be taken only once for credit. .

## Soc 687 - International Health Inequalities (4)

Explores the sociology of health and inequality in an international context. Topics include international health institutions, healthcare systems, and the social determinants of health inequalities in a global perspective.
Also offered as Soc 587 and may be taken only oncefor credit.

## Soc 688 -Social Sustainability Theory and Practice (4)

Healthy families; healthy communities; healthy democracies; economic, gender and racial equity; and socialjustice are all factors of social sustainability. This course will examine how to measure and how to reach these goals, by examining models locally, nationally and internationally. We will look at best practices of city, state and national governments, businesses, unions, and NGOs. We will also examine the relationship between economic, environmental and social sustainability.
Also offered as Soc 588 and may be taken only once for credit.

## Soc 692 - Foundations of Ecosystem Services (4)

Learn key ecological, social, economic and philosophical theories that underlie ecosystem services science and management. Examine ecological processes, policy and governance in managing these systems, as well as impacts of changing climate, human demographics, etc. This is the same course as ESR 692 and may be taken only once for credit.

Cross-Listed as: ESR 692.

## Soc 694 - Analysis of the Impacts of Social and Management Practices on EcosystemServices (4)

Examination of socialforces and institutions that influence use and guide policy for management of ecosystem services. Investigation of inter-juris dictional governance of natural systems to establish law and policy that promote investment in ecosystems to create sustainable cities.

## Soc 695 - Advanced Quantitative Methods (4)

Introduces a range of advanced quantitative methods commonly found in published research in sociology. Particular attention will be paid to the techniques commonly used to address the most common shortcomings of sociological data, including estimation of multivariate models with categ orical dependent variables (i.e. logistic regression) and to nonparametric methods for analyzing data.
Als o offered for graduate-level credit as Soc 595 and may be taken only once for credit. Prerequisite: Soc 593, or Stat 543 or equivalent.

## Soc 695L-Advanced Methods inSociology Lab (0)

Lab for Advanced Methods in Sociology.

## Soc 698 - Globalization Seminar (4)

Analysis of the ways in which economic patterns that reach across national boundaries affect the security of communities and theirstandards of living. Topics include how different economic clas ses fare in the rapid reshuffling of national economies that globalization entails; the role of international institutions in shaping economic globalization; the experience and responses of workers as a group; and the role of states in facilitating or resis ting the adverse impacts of globalization.
Also offered as Soc 598 and may be taken only once for credit.

## Span-Spanish

## Span 101 - First-Year Spanish Term 1 (4)

An introduction to elementary Spanish. Emphasis on listening comprehension and oral practice, the elements of grammar, vocabulary building, andelementary readings. This is the first course in a sequence of three: Span 101, Span 102, and Span 103.

## Span 101M- First-year Spanish Modified (4)

An introduction toelementary Spanish. Emphasis on listening comprehension and oral practice, the elements of grammar, vocabulary building, andelementary readings.

## Span 102 - First-Year Spanish Term2 (4)

An introduction toelementary Spanish. Emphasis on lis tening comprehension and oral practice, the elements of grammar, vocabulary building, andelementary readings. This is the second course in a sequenceof three: Span 101, Span 102, and Span 103.

## Span 102M- First-year Spanish Modified (4)

An introduction to elementary Spanish. Emphasis on listening comprehension and oral practice, the elements of grammar, vocabulary building, andelementary readings.

## Span 103 - First-Year Spanish Term3 (4)

An introduction to elementary Spanish. Emphasis on listening comprehension and oral practice, the elements of grammar, vocabulary building, andelementary readings.

This is the third course in a sequence of three: Span 101, Span 102, and Span 103.

## Span 103M- First-year Spanish Modified (4)

An introduction toelementary Spanish. Emphasis on listening comprehension and oral practice, the elements of grammar, vocabulary building, andelementary readings.

## Span 150 - First-year Spanish (Intensive) (6)

A two-termcourse covering the content of Span 101, 102, 103.

## Span 151 - First-year Spanish (Intensive) (6)

A two-termcourse covering the content of Span 101, 102, 103.

Span 199-Special Studies (1-12)
(Credit to be arranged.)

## Span 201 -Second-Year Spanish Term 1 (4)

Intensive review of basic materials introduced in first-year programand further development of communication skills. This is the first course in a sequence of three: Span 201, Span 202, and Span 203. Expected preparation: Span 103.

## Span 201H-Second-year Spanish Heritage ()

Intensive review of basic materials introduced in first-year programand further development of communication skills. Expected preparation: Span 103.

## Span 202 -Second-Year Spanish Term 2 (4)

Intensive review of basic materials introduced in first-year programand further development of communication skills. This is the second course in a sequence of three: Span 201, Span 202, and Span 203. Expected preparation:Span 103.

## Span 202H-Second-year Spanish Heritage ()

Intensive review of basic materials introduced in first-year programand further development of communication skills. Expected preparation: Span 103.

## Span 203 -Second-Year Spanish Term 3 (4)

Intensive review of basic materials introduced in first-year programand further development of communication skills. This is the third course in a sequence of three: Span 201, Span 202, and Span 203. Expected preparation: Span 103.

## Span 203H-Second-year Spanish Heritage ()

Intensive review of basic materials introduced in first-year programand further development of communication skills. Expected preparation: Span 103.

## Span 299-Special Studies (1-12)

(Credit to be arranged.)

## Span 299H-Special Studies (1-12)

(Credit to be arranged.)

## Span 301 - Third-year Spanish (4)

Spanish language study to help develop advanced proficiency. Intensive grammar instruction in preparation for upper division courses in culture, linguistics and literature. Emphasis on speaking, listening comprehension, reading, and writing skills for analysis and research. This is the first course in a sequence of three: Span 301, Span 302, and Span 303. It is preferable to take the sequencein order.

## Span 301H- Third-year Spanish Heritage ()

Continued work on the Spanish language at intermediateadvanced level. Prepares student for upper divis ion classes. Intensive grammar review. Span 301 emphasizes listening comprehension and speaking. Recommended: Span 203. Span 302 emphasizes reading and writing. Highly recommended: Span 301. Span 303 emphasizes oral and written skills in order to prepare student for literary analys is and critical writing. Highly recommended: Span 301 and Span 302.

## Span 302 - Third-year Spanish (4)

Spanish language study to help developadvanced proficiency. Intensive grammar instruction in preparation for upper division courses in culture, linguistics and literature. Emphasis on speaking, lis tening comprehension, reading, and writing skills for analysis and research. This is the second course in a sequence of three: Span 301, Span 302, and Span 303. It is preferable to take the sequence in order.

## Span 302H- Third-year Spanish Heritage ()

Continued work on the Spanish language at intermediateadvanced level. Prepares student for upper division classes. Intensive grammar review. Span 301 emphasizes listening comprehension and speaking. Recommended: Span 203. Span 302 emphasizes reading and writing. Highly recommended: Span 301. Span 303 emphas izes oral and written skills in order to prepare student for literary analys is and critical writing. Highly recommended: Span 301 and Span 302.

## Span 303 - Third-year Spanish (4)

Spanish language study to help develop advanced proficiency. Intensive grammar instruction in preparation for upper division courses in culture, linguistics and literature. Emphas is on speaking, listening comprehension, reading, and writing skills for analysis and research. This is the third course in a sequence of three: Span 301, Span 302, and Span 303. It is preferable to take the sequence in order.

## Span 303H- Third-year Spanish Heritage ()

Continued work on the Spanish language at intermediateadvanced level. Prepares student for upper division classes. Intensive grammar review. Span 301 emphas izes listening comprehension and speaking. Recommended: Span 203. Span 302 emphasizes reading and writing. Highly recommended: Span 301. Span 303 emphas izes oral and written skills in order to prepare student for literary analys is and critical writing. Highly recommended: Span 301 and Span 302.

## Span 311 - Spanish Conversation (4)

Practice of spoken Spanish through conversation, interviews, and listening to or viewing Spanish language broadcasts. Special language focus chosen by instructor, such as: pronunciation, word choice, the subjunctive, the sequence of tenses, or special time expressions.

Prerequisite: 8 credits of Span 301, 301H, 302, 302H, 303, or 303 H .

## Span 312 - Introduction to Teaching Spanish (4)

Introduction to the field of teaching Spanish. Students will explore current practices through observation and reflection, as well as research and discuss a variety of is sues related to Spanish language teaching. Students will identify and articulate theirown beliefs about teaching, and develop individual plans for professional development. Course is conducted in Spanish.

Prerequisite: 8 credits of Span 301, Span 302, or Span 303, or equivalent Spanish language proficiency.

## Span 313 - Business \& Culture in the Hispanic World

 (4)Solid foundation in Spanishbusiness vocabulary and cultural business concepts. Students will engage in situational role-play practices that will prepare themto successfully interact with today's growing Hispanic economies.
Prerequisite: 8 credits of Span 301, Span 302 or Span 303.

## Span 314 -Spanish inSocial and Legal Services (4)

Study of cultural and linguistic is sues that affect successful interaction with the Spanish-speaking community faced with matters concerning the law and social services.

Prerequisite: 8 credits of Span 301, Span 302, or Span 303.

## Span 315 -Written Translation (English-Span \& Span-

 English) (4)Practice in trans lating a variety of genres and styles, both literary and non-literary. It introduces the translation of specialized subjectmatter, in particular political texts and economic and financial texts. Students have the opportunity to analyze critically, and to resolve creatively, the problems in volving such is sues in translation as context, register, tone, and audience. Written translation is offered both fromEnglish to Spanish, and fromSpanish to English.
Prerequisite: 8 credits of any of these classes: Span 301, or Span 302, or Span 303, or Span 301H, or Span 302H, or Span 303H.

## Span 316 - Spanish and Medical Culture (4)

An his torical-descriptive and interdisciplinary perspective on the field and practice of medicine, this course will help students get familiar with the themes and vocabulary of the medical profession.
Prerequisite: 8 credits of Span 301, Span 302, or Span 303,.

## Span 317 -Spanish for Agriculture Purposes (4)

This class will improve student's Spanish agricultural vocabulary and their ability to describe and particpate in agricultural practices in Spanish. It will also give a summary of US agricultural policy and its connection to migrant communities; explaining theimpact of the international industrialization of agriculture on rural populations in both Latin America and the United States.

Prerequisite: 8 credits of any of these classes: Span 301, or Span 302, or Span 303, or Span 301H, or Span 302H, or Span 303H.

## Span 325 -Spanish Phonetics and Phonology (4)

Introduction to the sounds of Spanish: their place and manner of articulation (phonetics) as well as how they pattern with respect to each other and as influenced by morphological and syntactic factors (phonology).
Prerequisite: Eight credits of Span 301, Span 302, or Span 303.

## Span 330 - Peninsular Culture and Civilization (4)

Historical development of life, thought, and the arts in Spain.

Prerequisite: Eight credits of Span 301, Span 302, or Span 303. .

## Span 331 - Latin American Culture and Civilization (4)

Historical development of life, thought, and the arts in Latin America.

Prerequisite: Eight credits of Span 301, Span 302, or Span 303.

## Span 341 - Pre-Modern Cultural and Literary Foundations (4)

Study of medieval and/or pre-Colombian cultural texts and practices that formthe foundations of Spanish literary traditions.

Prerequisite: $\operatorname{Span} 301, \operatorname{Span} 302$, and $\operatorname{Span} 303$.

## Span 342 - Early Modern and Colonial Cultural and Literary Expression (4)

Study of Early Modern Spanish and/or Hispanic American literary practices and works from the 15th to the 17th century.

Prerequisite: Span 301, Span 302, and Span 303.
Span 343 - Cultural and Literary Expressions of Independence (4)

Study of Spanish and/or His panic American literary practices and works in the context of 18th-, 19th-, and 20th-century independence and republican movements.
Prerequisite: Span 301, Span 302, and Span 303.
Span 344-Modern Cultural and Literary Expressions (4)

Study of Spanish and/or His panic American literary practices and works in the 20th century with emphases on war, dictatorship, revolution and globalization.

Prerequisite: Span 301, Span 302, and Span 303.

## Span 345 - Present-Day Cultural and Literary Expression (4)

Study of contemporary Spanish and/or His panic American literary practices, works, and new media and works in global and digital contexts.
Prerequisite: Span 301, Span 302, and Span 303.

## Span 395-Spanish in the World (4)

The expansion of Spanish through media, Spanish and the other official languages of the Iberian Peninsula, Spanish in the USA, and the language politics of Latin America.

## Span 399 -Special Studies (1-12)

(Credit to be arranged.)

## Span 399U- Special Studies (4)

(Credit to be arranged.)

Span 401 - Research (1-6)
(Credit to be arranged.)

## Span 404-Cooperative Education/internship(1-12)

(Credit to be arranged.)

## Span 405 - Reading and Conference (1-6)

(Credit to be arranged.)

## Span 407 -Seminar (0-6)

(Credit to be arranged.)

## Span 408 - Workshop(1-6)

(Credit to be arranged.)

## Span 409-Practicum(1-12)

(Credit to be arranged.)

## Span 410 -Selected Topics (1-12)

(Credit to be arranged.)

## Span 411 - Advanced Spanish (4)

Intens ive training in composition, translation, and conversation. May be taken concurrently with Span 414 or Span 514.
Also offered for graduate-level credit as Span 511 and may be taken only once for credit. . Prerequisite: Span 301, Span 302, and Span 303.

## Span 414 - Advanced Spanish Grammar (4)

A thorough study of grammar and syntax for majors and prospective teachers. May be taken concurrently with Span 411 or Span 511.
Also offered for graduate-level credit as Span 514 and may be taken only once for credit. . Prerequisite: Span 301, Span 302, and Span 303.

## Span 421 - Major Topics: Peninsular Prose (4)

Study, analysis, and critique of major prose works of Spain by authors such as Fernando de Rojas, Cervantes, Galdos, Unamuno, and Goytisolo.

Also offered for graduate-level credit as Span 521. . Prerequisite: 4 credits of Span 341, Span 342, Span 343, Span 344, or Span 345.

Span 422-Major Topics: Peninsular Drama (4)
Study, analysis, and critique of major dramatic works of Spain by authors such as Lope de Vega, Tirso de Molina, Calderon de la Baraca, Zorrilla, Garcia Lorca, and Buero Vallejo.

Also offered for graduate-level credit as Span 522. Prerequisite: 4 units of Span 341, Span 342, Span 343, Span 344 or Span 345.
Span 423-Major Topics: Peninsular Poetry (4)
Study, analysis, and critique of the poetry of Spain by authors such as Berceo, Gongora, Quevedo, Machado, Jimenez, and Cernuda.
Also offered for graduate-levelcredit as Span 523. Prerequisite: 4 units of SPAN 341, Span 342, SPAN343, SPAN 344 or SPAN 345.

## Span 427 - Major Topics: Latin American Prose (4)

Study, analysis, and critique of major prose works of Lat in America by authors such as Garcia Marquez, Fuentes, Paz, Vargas Llosa, Mastretta, and Borges. The course may be repeated for up to 12 credits.
Also offered for graduate-level credit as Span 527. . Prerequisite: 4 credits of Span 341, Span 342, Span 343, Span 344, or Span 345.

## Span 428 - Major Topics: Latin American Drama (4)

Study, analysis, and critique of major dramatic works of Latin America by authors such as Gambaro, Benedetti, Usigli, Diaz, and de la Parra.
Also offered for graduate-level credit as Span 528. . Prerequisite: 4 credits of Span 341, Span 342, Span 343, Span 344, or Span 345.

## Span 429 - Major Topics: Latin American Poetry (4)

Study, analysis, and critique of major prose works of Latin America, by authors such as Dario, Huidobro, Vallejo, Neruda, Guillen, and Mistral.

Also offered for graduate-level credit as Span 529. . Prerequisite: 4 credits of Span 341, Span 342, Span 343, Span 344, or Span 345.

## Span 430 - Major Topics: Ibero-American Film (4)

Study, analysis, and critique of films from Ibero-America on such topics as national film traditions, Cinema Novo, Third Cinema, violence, migration, gender studies, and globalization. Course may be repeated for credit when topics vary.
Also offered for graduate-level credit as Span 530. .
Prerequisite: 4 credits of Span 341, Span 342, Span 343, Span 344, or Span 345.

## Span 434-Major Topics: Peninsular Multiple Genres

 (4)Study, analysis, and critique of works in multiple genres on such topics as Medieval Literature, the Celestina, W omen Writers, Literature of the Franco Years, the Poetry \& Drama of Garcia Lorca, and the Generation of '98. Course may be repeated forcredit when topics vary.
Also offered for graduate-level credit as Span 534. . Prerequisite: 4 credits of Span 341, Span 342, Span 343, Span 344, or Span 345.

## Span 436 - Major Topics: Latin American Multiple Genres (4)

Study, analysis, and critique of works in multiple genres on such topics as Transvestism, Feminism, Sickness and Literature, Prose and Poetry of Borges, and Pre-Colombian Literature. Course may be repeated for credit when topics vary.

Also offered for graduate-level credit as Span 536. . Prerequisite: 4 credits of Span 341, Span 342, Span 343, Span 344, or Span 345.

## Span 441 - Major Works in Translation (4)

Study of selections frommas terpieces in translation by authors such as Cervantes, Neruda, Borges, Lispector, and Garcia Marquez. Readings, lectures, and discussions in

English. Expected preparation: 4 credits of upper division literature.

Also offered for graduate-level credit as Span 541 and may be taken only once for credit. .

## Span 490 - History of the Spanish Language (4)

Study of the development of the Spanish language in terms of phonological, morphological, and syntactical changes.

Also offered for graduate-level credit as Span 590 and may be taken only once for credit. . Prerequisite: Span 301, Span 302, Span 303, and Span 325.

## Span 494 -Spanish Linguistics (4)

Introduction to the basic concepts of linguistics and their application to the Spanish language. Emphasis on practical analys is of the sound system and the grammatical system. Brief survey of the his torical development, followed by an analys is of the phonetics, phonemics, morphology, and syntax of modern Spanish.
Also offered for graduate-level credit as Span 594 and may be taken only oncefor credit. . Prerequisite: Span 301, Span 302, Span 303, and Span 325.

## Span 495 -Spanish Dialectology (4)

Study of Spanish dialects with attention to geographic regions that differentiate the Spanish speaking world including official and unofficial varieties of Spanish in Europe, the Americas, Africa, and Asia.
Also offered for graduate-level credit as Span 595 and may be taken only once for credit. . Prerequisite: Span 325.

## Span 497 - Applied Spanish Linguistics (4)

A practical application of linguis tics to modern Spanish. Emphasis on a contrastive analy sis of the structure of Spanish and English. Expected preparation: 4 credits of linguistics.

Also offered for graduate-level credit as Span 597 and may be taken only once for credit. . Prerequisite: Span 301, Span 302, and Span 303.

## Span 498 -Spanish Syntax (4)

A practical approach to Spanish Syntax. Study and analysis of syntactical functions and sentence structure. Emphasis on modern grammatical theory and findings. Examination of discourse connectors. Expected preparation: 4 credits of linguistics.
Also offered for graduate-level credit as Span 598 and may be taken only oncefor credit. . Prerequisite: $\operatorname{Span} 301$, Span 302, and Span 303.

## Span 501 - Research (1-9)

(Credit to be arranged.)

## Span 502 - Independent Study (1-9)

(Credit to be arranged.)

## Span 503 -Thesis (1-9)

(Credit to be arranged.)

## Span 504-Cooperative Education/internship(1-9)

(Credit to be arranged.)

## Span 505 - Reading and Conference (1-6)

## (Credit to be arranged.)

## Span 507 -Seminar (1-6)

(Credit to be arranged.)

## Span 508 - Workshop(1-6)

(Credit to be arranged.)

## Span 509 - Practicum(1-9)

(Credit to be arranged.)

## Span 510 -SelectedTopics (1-6)

(Credit to be arranged.)

## Span 511 - Advanced Spanish (4)

Intensive training in composition, translation, and conversation. May be taken concurrently with Span 414 or Span 514.
Also offered for undergraduate-levelcredit as Span 411 and may be taken only once for credit. . Prerequisite: Span 301, Span 302, and Span 303.

Span 514 - Advanced Spanish Grammar (4)
A thorough study of grammar and syntaxfor majors and prospective teachers. May be taken concurrently with Span 411 or Span 511.

Also offered for undergraduate-levelcredit as Span414 and may be taken only once for credit. . Prerequisite: Span 301, Span 302, and Span 303.

## Span 521 - Major Topics: Peninsular Prose (4)

Study, analysis, and critique of major prose works of Spain by authors such as Fernando de Rojas, Cervantes, Galdos, Unamuno, and Goytisolo.
Also offered for undergraduate-level credit as Span 421.. Prerequisite: 8 credits of Span 341, Span 342, Span 343, Span 344, or Span 345.

## Span 522 - Major Topics: Peninsular Drama (4)

Study, analysis, and critique of major dramatic works of Spain by authors such as Lope de Vega, Tirso de Molina, Calderon de la Baraca, Zorrilla, Garcia Lorca, and Buero Vallejo.
Also offered for undergraduate-level credit as Span 422. Prerequisite: 8 credits of Span 341, Span 342, Span 343, Span 344, or Span 345.

## Span 523-Major Topics: Peninsular Poetry (4)

Study, analysis, and critique of the poetry of Spain by authors such as Berceo, Gongora, Quevedo, Machado, Jimenez, and Cernuda.

Also offered for undergraduate-level credit as Span 423. Prerequisite: 8 credits of Span 341, Span 342, Span 343, Span 344, or Span 345.

Span 527-Major Topics: Latin American Prose (4)
Study, analysis, and critique of major prose works of Latin America by authors such as Garcia Marquez, Fuentes, Paz, Vargas Llosa, Mastretta, and Borges. The course may be repeated for up to 12 credits .

Also offered for undergraduate-level credit as Span 427.. Prerequisite: 8 credits of Span 341, Span 342, Span 343, Span 344, or Span 345.

Span 528 -Major Topics:Latin American Drama (4)
Study, analysis, and critique of major dramatic works of Latin America by authors such as Gambaro, Benedetti, Usigli, Diaz, and de la Parra.

Also offered for undergraduate-level credit as Span 428. . Prerequisite: 8 credits of Span 341, Span 342, Span 343, Span 344, or Span 345.

## Span 529-Major Topics:Latin American Poetry (4)

Study, analysis, and critique of major prose works of Lat in America, by authors such as Dario, Huidobro, Vallejo, Neruda, Guillen, and Mistral.

Also offered for undergraduate-level credit as Span 429.. Prerequisite: 8 credits of Span 341, Span 342, Span 343, Span 344, or Span 345.
Span 530 - Major Topics: Ibero-American Film (4)
Study, analysis, and critique of films from Ibero-America on such topics as national film traditions, Cinema Novo,

Third Cinema, violence, migration, gender studies, and globalization. Course may be repeated forcredit when topics vary.
Also offered for undergraduate-levelcredit as Span 430. . Prerequisite: 8 credits of Span 341, Span 342, Span 343, Span 344, or Span 345.

## Span 534-Major Topics: Peninsular Multiple Genres

 (4)Study, analysis, and critique of works in multiple genres on such topics as Medieval Literature, the Celestina, Women Writers, Literature of the Franco Years, the Poetry Drama of Garcia Lorca, and the Generation of '98. Course may be repeated forcredit when topics vary.
Also offered for undergraduate-levelcredit as Span 434. . Prerequisite: 8 credits of Span 341, Span 342, Span 343, Span 344, or Span 345.

## Span 536-Major Topics: Latin American Multiple Genres (4)

Study, analysis, and critique of works in multiple genres on such topics as Transvestism, Feminism, Sickness and Literature, Prose and Poetry of Borges, and Pre-Colombian Literature. Course may be repeated for credit when topics vary.
Also offered for undergraduate-levelcredit as Span 436. . Prerequisite: 8 credits of Span 341, Span 342, Span 343, Span 344, or Span 345.

## Span 541 - Major Works in Translation (4)

Study of selections frommasterpieces in translation by authors such as Cervantes, Neruda, Borges, Lispector, and Garcia Marquez. Readings, lectures, and discussions in English. Expected preparation: 4 credits of upper division literature.
Also offered for undergraduate-levelcredit as Span 441 and may be taken only once for credit.
Span 551 - Hispanic Poetry (4)
Critical study of the lyric poetry of Latin America and/or Spain.

## Span 552 -Hispanic Drama (4)

Critical study of representative works of Latin American and/or Spanish drama.

## Span 553 - Hispanic Prose (4)

Critical study of representative works of the proseof Latin America and/or Spain.

## Span 554 -Language, Culture and Interdisciplinary Practices (4)

Critical study of works in language, culture, and interdisciplinary practices in Spanish-speaking countries.

## Span 590 - History of the Spanish Language (4)

Study of the development of the Spanish language in terms of phonological, morphological, and syntactical changes.
Also offered for undergraduate-level credit as Span 490 and may be taken only once for credit. . Prerequisite: Span 301, Span 302, Span 303, and Span 325.

## Span 594 -Spanish Linguistics (4)

Introduction to the basic concepts of linguistics and their application to the Spanish language. Emphasis on practical analys is of the sound system and the grammatical system. Brief survey of the his torical development, followed by an analys is of the phonetics, phonemics, morphology, and syntax of modern Spanish. Must be taken in sequence.
Also offered for undergraduate-level credit as Span 494 and may be taken only once for credit. . Prerequisite: Span 301, Span 302, Span 303, and Span 325.

## Span 595-Spanish Dialectology (4)

Study of Spanish dialects with attention to geographic regions that differentiate the Spanish speaking world including official and unofficial varieties of Spanish in Europe, the Americas, Africa, and Asia.

Also offered for undergraduate-level credit as Span 495 and may be taken only once for credit.

## Span 597 - Applied Spanish Linguistics (4)

A practical application of linguistics to modern Spanish. Emphasis on a contrastive analy sis of the structure of Spanish and English. Expected preparation: 4 credits of linguistics.
Also offered for undergraduate-level credit as Span 497 and may be taken only once for credit. . Prerequisite: Span 301, Span 302, and Span 303.

## Span 598 - Spanish Syntax (4)

A practical approach to Spanish Syntax. Study and analysis of syntactical functions and sentence structure. Emphasis on modern grammatical theory and findings. Examination of discourse connectors. Expected preparation: 4 credits of linguistics.
Also offered for undergraduate-level credit as Span 498 and may be taken only once for credit. . Prerequisite: Span 301, Span 302, and Span 303.

## SpEd - Special Education

## SpEd 120 - Career and Community Studies First Year of Study (2)

This course will support first year students to actively engage in academic studies, employment, independent living and campus life. Students will meet with their CCS advis or, academic coach and peer navigator each week and attend a series of three seminars. Students will learn to more fully participate in their person-centered planning meetings, use their individualized supports, develop college goals, and practice skills that will be critical to their success during and after college.

## SpEd 199 -Special Studies (1-6)

(Credit to be arranged.)

## SpEd 220 - Career and Community Studies Second Year of Study (2)

This course will support second year Career and Community Studies (CCS) students to increase their independence and engagement in college through a full range of individualized supports with seminar and workshop options to choose fromeach term. Students will learn to make decisions about academic course options, use their supports, expand their experiences on campus, dis cover career interests while on the job, speak up for themselves within planning meetings, and setcollege goals.
Prerequisite: SpEd 120.

## SpEd 320 - Career and Community Studies Third Year of Study (2)

This course will support third year Career and Community Studies (CCS) students to increase their independence and engagement in college through a full range of individualized supports with seminar and workshop options to choose fromeach term. Students will self manage their supports, use their voices and make informed decisions, expand their experiences on campus, deepen their awareness of career pathways, learn to lead their planning meetings, and meet their college goals.
Prerequisite: SpEd 120 and SpEd 220.
SpEd 401 - Research (1-6)
(Credit to be arranged.)

SpEd 402 - Independent Study (0-9)
(Credit to be arranged.)

## SpEd 403 - Thesis (1-6)

(Credit to be arranged.)

SpEd 404-Cooperative Education/Internship (1-12)
(Credit to be arranged.)

## SpEd 405 - Reading and Conference (1-6)

(Credit to be arranged.)

## SpEd 406 -Special Problems (1-6)

(Credit to be arranged.)

SpEd 407 -Seminar (1-6)
(Credit to be arranged.)

SpEd 408-Workshop(1-6)
(Credit to be arranged.)

SpEd 409-Practicum(1-12)
(Credit to be arranged.)

## SpEd 410 - Experimental Course (1-12)

(Credit to be arranged.)

## SpEd 411 - Foundations of Special Education (3)

Introduces research, theory and data as foundation for guiding decision making and professional practice in special education guided by the "Critical Concepts" of Special Education" as identified by department faculty including Individualization; Inclusion and Diversity; Scaffolding Instruction; Data-based Decision Making; Collaboration and Teaming; and Leadership and Advocacy.
Also offered for graduate-level credit as SpEd 511 and may be taken only once for credit. Prerequisite: Admis sion to the Special Educator Licensure Programor MS in Special Education.

## SpEd 412 -Diagnostic Assessment (3-4)

The focus of this course is the legal requirements and professional skills required for conducting non-biased, standardized, academic as sessments. Students will develop knowledge and skills in: collecting relevant background
information; selecting, administering, and interpreting as sessments; developing academic goals and objectives; preparing meaningfulreports; and conducting meetings to convey assessment results.
Also offered for graduate-level credit as $\operatorname{SpEd} 512$ and may be taken only once for credit. Prerequisite: Mth 211, Mth 212, $\operatorname{SpEd} 418$, and admission to the program.
SpEd 414 -Legal and Ethical Foundations of Special Education (3)

Overview of state and federal laws, rules and regulations, including analysis of the Individuals with Dis abilities Education Act (2004), and their impact on service provision for students with dis abilities. Is sues of ethics, inclusion, and diversity are integrated within this course. Application of Oregon Administrative Rules will be highlighted.
Also offered for graduate-level credit as SpEd 514 and may be taken only once for credit. Prerequisite: Admis sion to the Special Educator Licensure ProgramorMS in Special Education.

## SpEd 415 - Classroom Ass essment, Instruction, and Behavior Management (Elementary) (4)

Focus on establishing effective instructional environments through research-based techniques of behavior management, assessment, and instructional delivery in elementary settings.
Also offered for graduate-level credit as SpEd 515 and may be taken only once for credit. Prerequisite: Admis sion to the Special Educator Licensure Programor MS in Special Education.

## SpEd 416 - Classroom Assessment, Instruction, and Behavior Management (Secondary) (4)

Establishing effective instructional environments through research-based techniques of behavior management, as sessment, and instructional delivery.
Also offered for graduate-level credit as $\operatorname{SpEd} 516$ and may be taken only once for credit. Prerequisite: Admis sion to the Special Educator Licensure Programor MS in Special Education.

## SpEd 417 - Introduction to Special Education (4)

Provides an introduction to the field of special education and the use of evidence-based teaching practices in special education. Students explore particular career options of interest and participate in a community-based learning experience in public school settings with learners who are at-risk or have special education needs. Recommended prerequisite (or concurrentenrollment): Psy 311, SpEd 418.

## SpEd 418 -Survey of Exceptional Learners (3)

Overview of working with exceptional individuals, including special education and multicultural differences. Nature of diversities (including the talented and gifted) and educational ramifications for the teacher. Expected preparation: Psy 311.

Also offered for graduate-level credit as $\operatorname{SpEd} 518$ and may be taken only once for credit. .

## SpEd 419 - Principles of Special Education (3)

Prepares students entering special education with basic knowledge, skills, and values necessary for future success in their profession. Major overview of theory and res earch underly ing delivery of special education services in the public schools. Intensive study of career planning, graduate writing and research, information systems, current legislation, teaching and learning theory, curricular models, and professional ethics and standards. Expected preparation(or concurrent enrollment): Psy 311, SpEd 418.

Also offered for graduate-level credit as SpEd 519 and may be taken only once forcredit..

## SpEd 420-Career and Community Studies Fourth Year of Study (2)

This course will support fourth year Career and Community Studies (CCS) students to increase their independence and engagement in college through a full range of individualized supports with seminar and an ePortfolio workshop series each term. Students will set goals for finishing college, transition to a career-focused job off campus, expand their experiences in the community, develop a portfolio, lead their planning meetings, and direct their supports at college and in the community.

Prerequisite: $\operatorname{SpEd} 120, \operatorname{SpEd} 220$ and $\operatorname{SpEd} 320$.
SpEd 422 - Comprehensive Individualized Assessment and CurriculumI (3)
Applies knowledge and skills for functional assessment and applied behavior analysis in the design and implementation of an individualized curriculumfor individuals with significant and multiple dis abilities. Emphasizes curricular content for life skills, communication, social, motor, and cognitive/functional academic domains. Provides instructional strategies for routines-based, naturalistic, and teacher-directed learning. This is the first course in a sequence of two: SpEd 422 and SpEd 423.

Also offered for graduate-level credit as SpEd 522 and may be taken only once for credit. Prerequisite: Admis sion to the program.

## SpEd 423 -Comprehensive Individualized Assessment and Curriculum II (3)

Applies knowledge and skills for functional assessment and applied behavior analysis in the design and implementation of an individualized curriculumfor individuals with significant and multiple dis abilities. Emphasizes curricular content for life skills, communication, social, motor, and cognitive/functional academic domains. Provides instructional strategies for routines-based, naturalistic, and teacher-directed learning. This is the second course in a sequence of two: SpEd 422 and SpEd 423.
Also offered for graduate-level credit as SpEd 523 and may be taken only once for credit. Prerequisite: Admis sion to the program.

## SpEd $\mathbf{4 2 5}$-Student Teaching (6-15)

This full-time student teaching experience provides opportunities for students to apply, practice, and generalize concepts and skills learned in university courses. Students will have opportunities toobserve and participate in the responsibilities of the special educator, and further develop their skills in instruction and classroom management.
Also offered for graduate-level credit as $\operatorname{SpEd} 525$.
Prerequisite: Mth 211, Mth 212, SpEd 418 and admiss ion to program. Corequisite: SpEd 426.

## SpEd 426 - IEP and Collaborative Teaming (4)

This course is about the processes and skills involved in collaborative teaming and consultation within schools settings. Throughout the studentteaching experience, course participants will learn about their role in the IEP process, experience a full range of profes sional res ponsibilities including ins tructional and nonins tructional roles, and prepare an edTPA portfolio.
Also offered for graduate-level credit as SpEd 526 and may be taken only once for credit. Prerequisite:Mth 211, Mth 212, SpEd 418 and admis sion to program. Corequisite: $\operatorname{SpEd} 425$.

## SpEd 427 -IEP and Collaborative Teaming

 (Secondary) (3)This course examines collaborative teaming and consultation among teaching professionals, students, families, paraprofessionals, adminis trators and service personnel in the context of culturally diverse schools and communities. Carefulexamination of the IEP process will help define requis ite case management skills and effective meeting facilitation skills that promote productiveteaming processes.
Also offered for graduate-level credit as SpEd 527 and may be taken only once for credit. Prerequisite:Admis sion to the Special Educator Licensure ProgramorMS in Special Education.

## SpEd 430 - Families and Advocacy (3)

This course investigates practicals trategies in the areas of student support and ad vocacy, school-family collaboration and transition planning. Person-centered planning and teaching self-determination skills will be addres sed. Course participants will examine collaborative skills needed to empower students and families to work effectively with school professionals in K-12 and transition settings.
Also offered for graduate-level credit as SpEd 530 and may be taken only once for credit. Prerequisite: Admis sion to program.

## SpEd 431 - Families and Advocacy (Secondary) (3)

Inves tigate practical strategies, tools and exemplary practitioners in the areas of studentsupport and advocacy, school-family collaboration and transition planning. Address concepts and curriculumrelated to personcentered planning and teaching self-determination skills. Examine collaborative skills needed to empower students, families, service agencies, and other support systems to facilitate inclusive practices.
Also offered for graduate-level credit as SpEd 531 and may be taken only once for credit. Prerequisite: Admis sion to the Special Educator Licensure Programor MS in Special Education.

## SpEd 432 - Inclusive Practices (2)

This course prepares teacher candidates to useevidencebased practices to support students with diverse learning needs togain access to the general education curriculum. Incorporating Universal Design for Learning as a framework, teacher candidates will plan, implement and as sess study skills and learning strategies forstudents in all academic areas.
Also offered for graduate-level credit as SpEd 532 and may be taken only once for credit. Prerequisite: Mth 211, Mth 212, SpEd 418 and admission to the program.

## SpEd 433-Math Assessment andInstruction (3)

Examine assessment, instructional methods, and curricula for teaching math and supporting the learning of SPED students at the elementary and secondary levels. Learn techniques for teaching concepts, skills, problemsolving, and learning strategies as means to help learners achieve success in school and beyond the secondary levels.
Also offered for graduate-le vel credit as SpEd 533 and may be taken only once for credit. Prerequisite: Admis sion to the Special Educator Licensure Programor MS in Special Education.

## SpEd 437-Reading Assessment and Instruction (Elementary) (3-4)

Teacher candidates will develop a foundation in researchbased instruction for reading to children pre-kindergarten through eighth grade with a broad range of skills and needs in special and regulareducation. Course provides an overview of language and reading development, instructional practices for teaching, and assessing core early literacy skills.
Also offered for graduate-level credit as SpEd 537 and may be taken only once for credit. Prerequisite: Admis sion to program.

## SpEd 438 - Reading Assessment and Instruction (Secondary) (3-4)

Develop the knowledge base and skills for effectively teaching reading skills to students with high incidence dis abilities in schools. Address ins tructional methods for students who are emergent, developing, and more fluent readers and writers. Explore the use of research-based reading programs and other literacy materials in grades 612.

Also offered for graduate-level credit as SpEd 538 and may be taken only once for credit. Prerequisite: Admis sion to program.

## SpEd 439 -Historical and Contemporary Issues in Disability Studies (4)

Examines how views of disability in schools and other social contexts challenge traditional understandings of dis ability in the field of special education. Students will examine their views of dis ability through analy sis of texts produced by writers with dis abilities and the examination of society's treatment of persons with dis ability.
Also offered for graduate-level credit as SpEd 539 and may be taken only once for credit. Prerequisite: Upperdivision standing.

## SpEd 448 -Positive Behavior Support in the Classroom

 (3)This course will teach research-based strategies within a positive behavior support framework to promote desired clas sroombehavior and maximize instructional time. Prevention, teaching and consequence strategies (positive and corrective) will be taught for implementation ranging from school-wide intervention to classroom-wide instruction to individualized function-based support for students with intensive needs.

Also offered for graduate-level credit as SpEd 548 and may be taken only once for credit. . Prerequisite:
Admis sion to the Special Educator Licensure Program.

## SpEd 455 - Working With LEP Children Who Have Special Needs (2)

Examine the current research in special education and see where it is appropriate in working with the Limited English Proficient (LEP) child. Consider issues including testing and diagnosis, appropriate teaching material and method, and placement. Discuss political, social, and community concerns in working with LEP students with special needs.
Also offered for graduate-level credit as $\operatorname{SpEd} 555$ and may be taken only once for credit.

## SpEd 460-Outdoor Education/Recreation With Pers ons With Disabilities (6)

Course provides a supervised practicumin a variety of outdoor activities with children, youth, and adults with disabilities. Students serve as counselor trainees, under the guidance of experienced outdoor specialists and teachers in a residential programlocated at the Mt . Hood Kiwanis Camp. Emphasis on learning fromand about persons with disabilities, teamwork within living groups, and developing outdoor and leadership skills.

Also offered for graduate-level credit as $\operatorname{SpEd} 560$ and may be taken only once for credit.

## SpEd 480 - Introduction to Early Intervention/Early Childhood Special Education (3)

Provides historical, social, and leg al foundations for early intervention and early childhood special edu cation and other services to young children with special needs. Introduces concepts and processes forscreening and as sessment, family-centered planning, blending developmentally and individually appropriate practices, providing learning opportunities in natural early childhood settings, planning environments and activities to include all children, and transition planning. Expected preparation: admission to programor permis sion of instructor.
Also offered for graduate-level credit as $\operatorname{SpEd} 580$ and may be taken only once forcredit. .
SpEd 481 - Family Guided Early Intervention (3)
Develops knowledge and skills necessary for providing early intervention services to infants and toddlers with developmental delay/disabilities and their families.

Also offered for graduate-level credit as SpEd 581 and may be taken only once for credit.
SpEd 482 -SpecializedTechniques: Early Intervention/Early Childhood Special Education (3)
Develops specialized knowledge and skills necessary for providing early intervention and early childhood special education services to infants, toddlers, and preschool children with severe and multiple disabilities, including children with physical and sensory impairments, children with health impairments, and children with autism.

Also offered for graduate-level credit as SpEd 582 and may be taken only once fror credit.

## SpEd 483 - Communication and Language

 Development: EI/SE (Early Intervention/Early Childhood Special Education) (3)Designed to provide information about typical and atypical communication development, birth through early childhood. In addition, information will include strategies for $\mathrm{EI} / \mathrm{SE}$ to promote communication development for all children. Expected preparation: SpEd 480/580 and admission to program.

Also offered for graduate-level credit as $\operatorname{SpEd} 583$ and may be taken only once for credit. .

## SpEd 487 - Introduction to Infant Toddler Mental Health (3)

Introductory course linking theory, research, and practice with interdisciplinary principles and collaboration. Key concepts of mental health of children (birth through 36 months) and their families including attachment, temperament, social-emotional development, context of family, culture and community, risk and resilience. Practices related to observation, screening, assessment, diagnosis; treatment.

Also offered for graduate-level credit as SpEd 587 and may be taken only once for credit. Prerequisite: Upperdivision standing.
SpEd 501 - Research (1-9)
(Credit to be arranged.)

## SpEd 502 -Independent Study (0-9)

(Credit to be arranged.)

## SpEd 503 -Thesis (1-9)

(Credit to be arranged.)

## SpEd 504 - Cooperative Education/Internship (1-9)

(Credit to be arranged.)

## SpEd 505 -Reading and Conference (1-6)

(Credit to be arranged.)

## SpEd 506 -Special Problems (1-6)

(Credit to be arranged.)

SpEd 507 -Seminar (1-6)
(Credit to be arranged.)

SpEd 508 - Workshop(1-6)
(Credit to be arranged.)

## SpEd 509-Practicum(1-9)

(Credit to be arranged.)

## SpEd 510 - Experimental Course (1-12)

Experimental course. Contact the department for a course description. (Credit to be arranged.)

## SpEd 511 - Foundations of Special Education (3)

Introduces research, theory and data as foundation for guiding decision making and professional practice in specialeducation guided by the "Critical Concepts" of Special Education" as identified by department faculty including Individualization; Inclusion and Diversity; Scaffolding Instruction; Data-based Decision Making; Collaboration and Teaming; and Leadership and Advocacy.

Also offered for undergraduate-level credit as SpEd 411 and may be taken only once forcredit. Prerequisite: Admis sion to the Special Educator Licensure Programor MS in Special Education.

## SpEd 512 - Diagnostic Assessment (3-4)

The focus of this course is the legal requirements and professional skills required for conducting non-biased, standardized, academic as sessments. Students will develop knowledge and skills in: collecting relevant background information; selecting, administering, and interpreting as sessments; developing academic goals and objectives; preparing meaningful reports; and conducting meetings to convey assessment results.

Also offered for undergraduate-level credit as SpEd 412 and may be taken only once forcredit. Prerequisite: Mth 211, Mth 212, SpEd 418 and Admis sion to program.

## SpEd 513-ClassroomBasedAssessment and Instructional Planning (3)

Informal, formative, ongoing assessment techniques for students with special needs in special and regular education settings. Using information from as sessments to make instructional decisions and for IEP documentation and planning.
Prerequis ite: SpEd 519 and admission to program.

## SpEd 514 -Legal and Ethical Foundations of Special Education (3)

Overview of state and federal laws, rules and regulations, including analysis of the Individuals with Disabilities Education Act (2004), and their impact on service provis ion for students with dis abilities. Is sues of ethics, inclusion, and diversity are integrated within this course. Application of Oregon Administrative Rules will be highlighted.
Also offered for undergraduate-levelcredit as SpEd 414 and may be taken only once for credit. Prerequisite: Admis sion to the Special Educator Licensure Programor MS in SpecialEducation.
SpEd 515 -Classroom Assessment, Instruction, and Behavior Management (Hementary) (4)

Focus on establishing effective instructional environments through research-based techniques of behavior management, assessment, and instructional delivery in elementary settings.
Also offered for undergraduate-level credit as SpEd 415 and may be taken only once for credit. Prerequisite: Admis sion to the Special Educator Licensure Programor MS in Special Education.

## SpEd 516 -Classroom Assessment, Instruction, and Behavior Management (Secondary) (4)

Establishing effective instructional environments through research-based techniques of behavior management, assessment, and ins structional delivery.
Also offered as undergraduate-level credit as SpEd 416 and may be taken only once for credit. Prerequisite: Admis sion to the SpecialEducator Licensure Programor MS in Special Education.

## SpEd 518 -Survey of Exceptional Learners (3)

Overview of working with exceptional individuals, including special education and multicultural differences. Nature of diversities (including the talented and gifted) and educational ramifications for the teacher.
Also offered for undergraduate-levelcredit as SpEd 418 and may be taken only once for credit. .

## SpEd 519 - Principles of Special Education (3)

Prepares students entering special education with basic knowledge, skills, and values necessary for future success in their profession. Major overview of theory and research underlying delivery of special education services in the public schools. Intensive study of career planning, graduate writing and research, information systems, current legis lation, teaching and learning theory, curricular models, and professional ethics and standards. Expected preparation(or concurrentenrollment: Psy 311, SpEd 418.

Also offered for undergraduate-level credit as $\operatorname{SpEd} 419$ and may be taken only once forcredit. .

## SpEd 520 - Collaboration I: Families and Community -

 EL and EI/SE (3)Designed to develop knowledge in the areas of family systems theory, strengths-based model, information gathering techniques, and collaboration techniques with families and profes sionals. Information related to cultural competence is infused throughout the course. In addition, students receive information on grief related to having a child with a disability and the death of a student. Students are required to participate in a family conversation project to identify family strengths, concerns, and resources with a family who has a child with special needs.

Prerequisite: admis sion to program.
SpEd 522 - Comprehensive Individualized Assessment and CurriculumI (3)
Applies knowledge and skills for functional assessment and applied behavior analysis in the design and implementation of an individualized curriculumfor individuals with significant and multiple dis abilities. Emphasizes curricularcontent forlife skills, communication, social, motor, and cognitive/functional academic domains. Provides instructional strategies for routines-based, naturalistic, and teacher-directed learning. This is the first course in a sequence of two: $\operatorname{SpEd} 522$ and SpEd 523.
Also offered for undergraduate-level credit as SpEd 422 and may be taken only once for credit. Prerequis ite: Admis sion to program.
SpEd 523 - Comprehensive Individualized Assessment and Curriculum II (3)
Applies knowledge and skills for functional assessment and applied behavior analysis in the design and implementation of an individualized curriculumfor individuals with significant and multiple dis abilities. Emphasizes curricular content for life skills, communication, social, motor, and cognitive/functional academic domains. Provides instructional strategies for routines-based, naturalistic, and teacher-directed learning. This is the secondcourse in a sequence of two: SpEd 522 and $\operatorname{SpEd} 523$.
Also offered for undergraduate-level credit as SpEd 423 and may be taken only once for credit. Prerequis ite: Admis sion to program.
SpEd 524 - Collaboration II: Schools and Inclusion Strategies (Mid-level/High School) (3)
Designed to help preservice teachers learn collaborative strategies that facilitate the inclusion of students with disabilities into thegeneral education program.

## SpEd 525 -Student Teaching (6-15)

Observation and teaching under the direction of a supervis ing teacher. Opportunities for as suming direct responsibility for the learning activities of the disabled learner, for developing skill in techniques of teaching and schoolroommanagement, and for participating in the life of the school.

Also offered for undergraduate-level credit as SpEd 425. Prerequisite: Sat is factory completion of SpEd 509 Directed Field Experience II. Corequisite: SpEd 526.

## SpEd 526-IEP and Collaborative Teaming (4)

This course is about the processes and skills involved in collaborative teaming and consultation within schools settings. Throughout the student teaching experience, course participants will learn about their role in the IEP process, experience a fullrange of profes sional responsibilities including instructional and noninstructional roles, and prepare an edTPA portfolio.
Also offered for undergraduate-levelcredit as SpEd 426 and may be taken only once for credit. Prerequis ite: Admis sion to program. Corequisite: SPED 525 and SPED 526 are taken together.

## SpEd 527 -IEP and Collaborative Teaming

 (Secondary) (3)This course examines collaborative teaming and consultation among teaching professionals, students, families, paraprofessionals, adminis trators and service personnel in the context of culturally diverse schools and communities. Carefulexamination of the IEP process will help define requisite case management skills and effective meeting facilitation skills that promote productiveteaming processes.

Also offered for undergraduate-levelcredit as SpEd 427 and may be taken only once for credit. Prerequisite: Admis sion to the Special Educator Licensure Programor MS in Special Education.

## SpEd 528 -Instructional Methods I: Literacy (Midlevel/High School) (3)

Develops knowledge and practices for teaching reading, writing, and other literacy skills to middle and secondary students with high incidence disabilities. Curriculum and instructional methods for students who are emergent, developing, and fluent readers and writers are addressed. The development of student's use of learning strategies to become more independent and effective learners is described.
Prerequisite: $\operatorname{SpEd} 519, \mathrm{Ed} 511$, and admis sion to program.

SpEd 529 - Instructional Methods II: Math and Content Instruction (Mid-level/High School) (3)
Purpose of this course is for preservice and practicing educators to develop the knowledge and skills to effectively teach mathematics and other content area subjects to students with mild disabilities in middle/secondary schools. Educators will learn how to use instructional methods and contentenhancement devices to make curricular content more accessible fors students with disabilities. Strategies for promoting retention, application, and generalization of content learning will also be examined.
Prerequisite: SpEd 519 and admission to program.

## SpEd 530 - Families and Advocacy (3)

This course investigates practicals trategies in the areas of student support and advocacy, school-family collaboration and transition planning. Pers on-centered planning and teaching self-determination skills will be addres sed. Course participants will examine collaborativeskills needed to empower students and families to work effectively with school professionals in K-12 and transition settings.
Also offered for undergraduate-level credit as $\operatorname{SpEd} 430$ and may be taken only once for credit. Prerequisite: Admission to program.
SpEd 531 - Families and Advocacy (Secondary) (3)
Investigate practical strategies, tools and exemplary practitioners in the areas of student support and advocacy, school-family collaboration and transition planning. Address concepts and curriculumrelated to personcentered planning and teaching self-determination skills. Examine collaborative skills needed to empower students, families, service agencies, and other support systems to facilitate inclus ive practices.
Also offered for undergraduate-level credit as SpEd 431 and may be taken only once for credit. Prerequisite: Admis sion to the Special Educator Licensure Programor MS in SpecialEducation.

## SpEd 532 - Inclusive Practices (2)

This course prepares teacher candidates to useevidencebased practices to support students with diverse learning needs to gain access to the general education curriculum. Incorporating Universal Design forLearning as a framework, teacher candidates will plan, implement and as sess study skills and learning strategies for students in all academic areas.
Prerequisite: Admission to the program. Cross-Listed as: SPED 432 This course prepares teacher candidates to use evidence-based practices to support students with diverse learning needs to gain access to the general education curriculum. Incorporating Universal Design for Learning
as a framework, teacher candidates will plan, implement and as sess study skills and learning strategies for students in all academic areas.

## SpEd 533-Math Assessment and Instruction (3)

Examine assessment, instructional methods, and curricula for teaching math and supporting the learning of SPED students at the elementary and secondary levels. Learn techniques for teaching concepts, skills, problemsolving, and learning strategies as means to help learners achieve success in school and beyond the secondary levels.

Also offered for undergraduate-levelcredit as SpEd 433 and may be taken only once for credit. Prerequisite: Admis sion to the Special Educator Licens ure Programor MS in SpecialEducation.

## SpEd 536 -SpecializedTechniques (3)

Information and skills developmentfor meeting the specialized support needs commonly found with students with significant disabilities. Focus on educational implications considering (1) the nature of the medical condition, (2) methods for instruction (i.e., positioning, mobility), and (3) procedures for structuralmodifications. Course incorporates information fromvarious disciplines and is designed to assist the educator in becoming an effective member of a transdisciplinary team that serves students with routine and emergency medical and physical needs.

Prerequisite: $\mathrm{SpEd} 418 / 518$ and admis sion to the program.

## SpEd 537 - Reading Assessment and Instruction

 (Elementary) (3-4)Teacher candidates will develop a foundation in researchbased instruction for reading to children pre-kindergarten through eighth grade with a broad range of skills and needs in special and regular education. Course provides an overview of language and reading development, instructional practices for teaching, and assessing core early literacy skills.

Also offered for undergraduate-levelcredit as SpEd 437 and may be taken only once for credit. Prerequisite: Admis sion to program.

## SpEd 538 - Reading Assessment and Instruction

 (Secondary) (3-4)Develop the knowledge baseand skills for effectively teaching reading skills to students with high incidence dis abilities in schools. Address instructional methods for students who are emergent, developing, and more fluent readers and writers. Explore the use of research-based reading programs and other literacy materials in grades 6 12.

Also offered for undergraduate-level credit as SPED 438 and may be taken only once for credit. Prerequisite: Admis sion to program.

## SpEd 539 -Historical and Contemporary Issues in Disability Studies (4)

Examines how views of dis ability in schools and other social contexts challenge traditionalunderstandings of disability in the field of specialeducation. Students will examine their views of disability through analy sis of texts produced by writers with dis abilities and the examination of society's treatment of persons with dis ability.
Also offered for undergraduate-level credit as SpEd 439 and may be taken only once for credit.

## SpEd 540 - Foundations of Education for the Visually Impaired Learner (3)

Provides historical educational background for students with visual impairments, common eye conditions, basic eye anatomy, and overview of instructional strategies with emphas is on the expanded core curriculum. Introduces Grade I braille and tactile graphics production. Addresses instructional considerations for diverse learners with vision loss, including additional dis abilities and deafblindness.

Prerequis ite: $\operatorname{SpEd} 418 / \mathrm{SpEd} 518$ and admiss ion to the program.

## SpEd 541 - Implications of Vision Problems of Children/Youth (3)

Anatomy, physiology, common diseases, and hygiene of the human eye. Emphasis on vision screening, testing, and techniques for evaluation of functional visual skills in the clas sroom. Focus includes strategies for improving medical/ optometric eye reports. Emphasis on working with the regular class roomteacher regarding prevention of potentialeye dis orders and referral to eye specialists.
Prerequisite: SpEd 540 and admission to the program.
SpEd 542 - Assessment of the Visually Impaired (3)
Examination and application of diagnostic and assessment instruments useful with or modified for visually impaired learners. Designed to prepare teachers of the visually disabled for administering, scoring, and interpreting test results for programplanning and implementation. Developmental areas includecognition, social/ emotional skills, psychomotor skills, and self-help skills.
Prerequisite: $\operatorname{SpEd} 418 / 518$ and admission to the program.

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SpEd 543 - Reading and Literacy - Visually Impaired Learners (3)
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This course provides an overview of language development and literacy instruction fromprereading through adolescence. Age-appropriate methods for literacy instruction will be discussed, with emphasis on similarities and differences between sighted print readers and readers with visual impairments, including blindness. Both conventional and functional literacy will be addressed.

SpEd 544 -Methods of Teaching Academics: Visually Impaired Learner (3)

Course focuses upon curricular adaptations for use with the visually impaired learner in the clas sroom. Academic areas examined and strategies for inclusion for the visually impaired learner in all aspects of the school curriculum. Teaching of Braille, use of abacus for mathematics, and adapted materials. In-depth curricular focus for the multidis abled child.
Prerequisite: $\operatorname{SpEd} 418 / 518$ and admis sion to the program.
SpEd 545 - Introduction to Orientation and Mobility and Independent Living Skills (3)
Introduces the his torical development and field of orientation and mobility (O\&M). Provides instruction in basic $\mathrm{O} \& \mathrm{M}$ and human guide techniques. Emphasizes evidence-based curricular content for independent living skills; psychosocial, motor, and concept development domains. Addresses instructional considerations for diverse 1 learners with vision loss, including additional dis abilities and deafblindness.

Prerequisite: $\operatorname{SpEd} 418 / \mathrm{SpEd} 518$.
SpEd 546 - Braille I (3)
The Braille code is presented, to include Grade II literary Braille, and use of the abacus.

Prerequisite: SpEd 540 and admission to the program.
SpEd 547 - Braille II (2)
All special signs and symbols relating to the literary code are learned and special formatting techniques used in printed materials, charts, and graphs. Study of Braille Nemeth Code for mathematics.
Prerequisite: $\operatorname{SpEd} 546$ and admission to the program.
SpEd 548 -Positive Behavior Support in the Classroom (3)

This course will teach research-based strategies within a positive behavior support framework to promote desired clas sroombehavior and maximize instructional time. Prevention, teaching and consequence strategies (positive and corrective) will be taught for implementation ranging from school-wide intervention to classroom-wide instruction to individualized function-based support for students with intensive needs.

Also offered for undergraduate-level credit as SpEd 448 and may be taken only once for credit. . Prerequis ite: Admis sion to the Special Educator Licensure Program.

SpEd 549 - Orientation and Mobility Methods (3)
Examine the foundations of learning and teaching Orientation and Mobility. Activities and synchronous online lectures introduce the principles of concept
development, spatial orientation, and environmental analys is as related to the independent travel of individuals who are visualimpairments including those with additional disabilities, deafblindness and/or fromdiverse backgrounds.
Prerequisite: SpEd 540, SpEd 541, SpEd 545.

## SpEd 550 - Orientation and Mobility Assessment and Instruction - Children (3)

Provides an overview of O\&M assessment and instruction for infants, preschoolers, elementary and transition age students with vision loss, including those fromdiverse backgrounds and additional dis abilities and deafblindness. Examines methods in teaminstruction, consultation and itinerant teaching. Includes 25 hours of field-based experiences in the school setting.

Prerequisite: SpEd 540, SpEd 541, SpEd 545.
SpEd 551 - Orientation and Mobility Assessment and Instruction - Adults (3)
Examines demographics and service delivery models for adults with visual impairments fromdiverse backgrounds, including those with health conditions and sensory impairments. Addresses O\&M as sessment and instruction while considering individual travel environments and emerging technologies. Includes 25 hours of field-based experiences with adults receiving $O \& M$ training.
Prerequisite: SpEd 540, SpEd 545, SpEd 541.

## SpEd 552 - Orientation and Mobility Advanced Techniques (4)

Instruction in navigation methods used by persons with vision loss. Students complete 5+hours lab based work per day under simulated conditions in indoor and outdoor environments. Course covers the knowledge base of the instructional needs of pers ons with vis ual impairments including those fromdiverse backgrounds, additional disabilities and deafblindness.

Prerequisite: SpEd 540, SpEd 541, SpEd 545.
SpEd 553 - Leisure Education for Pers ons with Disabilities (3)

Focuses on recreation and leisure as a major as pect of independent living and community adjustment. Roles of the schools in providing a comprehensive leis ure education programfor students with dis abilities.
Prerequisite: $\operatorname{SpEd} 418 / 518$.

## SpEd 554 - Orientation and Mobility Practicum (3-12)

Minimum 350 hour supervised internship for pre-service O\&M specialists with individuals with visual impairment, ranging fromschool-aged students to adult vocational and geriatric populations, including diverse learners with additional dis abilities and deafblindness. Integrates O\&M
coursework and field-based competencies tailored to pass the international ACVREP O\&M examination.

Prerequisite: SpEd 540, SpEd 541, SpEd 545, SpEd 549, SpEd 550, SpEd 551, and SpEd 552.

## SpEd 555 - Working With LEP Children Who Have Special Needs (2)

Examine the current research in special education and see where it is appropriate in working with the Limited English Proficient (LEP) child. Consider is sues including testing and diagnosis, appropriate teaching material and method, and placement. Discuss political, social, and community concerns in working with LEP students with special needs.
Also offered for undergraduate-levelcredit as SpEd 455 and may be taken only once for credit.

SpEd 556 - Career Education for Persons with Disabilities (3)

Course presents a broad conceptual framework for organizing and developing career education programs for dis abled students (elementary/young adult); helps participants gain knowledge which strengthens vocational success for dis abled persons; and programmodels train persons with dis abilities in transition fromschool to community life.

Prerequisite: $\operatorname{SpEd} 418 / 518$.

## SpEd 558 - Concepts and Principles of Applied Behavior Analysis (5)

Introduces students to the philosophical underpinnings of applied behavior analysis (ABA). It provides students with knowledge of ABA concepts and principles. Students will learn how to apply positive behavior support and technologicalmethods specific to the needs of the community in such settings as schools, clinics, and homes.

## SpEd 559 - Ass essing Behavior (5)

Students will learn the fundamental elements of behavior as sessment, how to identify behaviors appropriate for behavioral as sessment, selecting behavior goals and strategies, conducting indirect and direct assessments to identify behavior function, and addressing professional is sues that may arise during the process of behavioral as sessment.

## SpEd 560-Outdoor Education/Recreation With Persons With Disabilities (6)

Course provides a supervised practicumin a variety of outdoor activities with children, youth, and adults with dis abilities. Students serve as counselor trainees, under the guidanceof experienced outdoor specialists and teachers in a residential programlocated at the Mt. Hood Kiwanis

Camp. Emphas is on learning fromand about persons with disabilities, teamwork within living groups, and developing outdoor and leadership skills.
Also offered for undergraduate-level credit as SpEd 460 and may be taken only once for credit.

## SpEd 561 -PBS: Behavior-Change Strategies (5)

Focuses on the design of comprehensive, multicomponent, functional as sessment-based behavior support plans for individuals with a variety of dis abilities who engage in challenging behavior. Students learn how to apply the positive behavior support method and to choose appropriate andeffective behavior-change strategies to address behavior goals. These include the useof technology and responses to ethical and professional is sues in implementing behavior support plans.

## SpEd 562 - Ethical Issues in Applied Behavior Analysis (5)

Students learn how to apply ethical standards that are salient to the interactions in their work, with the people they serve, and with others involved in the process (e.g., other professionals, families, sy stems of care, society). Although the class focuses on the BACB's Professional and Ethical Compliance Code for Behavior Analy sts, other ethical standards will be reviewed as well.

## SpEd 563 - Advanced Techniques of Reading (3)

Primarily concerned with educational methods designed to teach students with severe to moderateres ponse deficits in reading.

Prerequisite: CI474/574.

## SpEd 564 - Learning Disabilities (3)

Concepts, is sues, and major sources in the field of learning disabilities: definition, causation and identification, ability vs.task analy sis models, perceptual training, and aptitude treatment interaction, early identification, and reading disability.

## SpEd 565 - Single-Subject Res earch Design in Applied Behavior Analysis (5)

Introduces students to the foundations of single-subject research designs and the application of single-case research methodology. The course content aligns with items on the BCBA TaskList (5th Edition). It provides students with the most effective experimental research methods to measure cutting-edgetreatments, such as innovative technological interventions and positive behavior support.

## SpEd 566 - Advanced Research Methods in ABA (4)

Students will demons trate their knowledge and application of single-caseresearch methodology. Specifically, the implementation of research proposals designed to answer applied research questions specific to the needs of the local community in schools, clinics, homes, and other settings. In addition to their managementof overall intervention implementation, students will as sess the quality of implementation and intervention impact.

## SpEd 567 -ABA Leadership Capstone (3)

As a culminating experience for students in the ABA Program, this course focuses on current is sues in ABA, supports students' preparation for the $B C B A ®$ exam, and supports students in formulating their own plan for supervision and management of supervisees. The topics selected for this seminar were guided by BACB® Task List (5th ed.) on what behavior analysts should know about the scienceof behavior analysis, as well as providing ABA services and supervision.

## SpEd 568 - Advanced Behavior Management (3)

Course for educational professionals serving students with challenging behavior. Focuses on a continuum of behavioral intervention in schools including functional behavioral as sessment and positive behavioral supports for students with challenging behavior.

Prerequisite: SpEd 521.

## SpEd 570 - Communication Systems for Persons with Severe Disabilities (3)

Course for students who will be teaching communication skills to pers ons with severe disabilities, including nonverbal individuals. Examines specialized systems for teaching communication skills, normal speech, and implementation of communication instruction.
Prerequisite: $\mathrm{SpEd} 418 / 518$.

## SpEd 571 - Adolescents with Learning Differences (2)

Explores the impact of various disabilities or other life experiences on learning and the developmental stage of adoles cence. Examines what middle and high school teachers need to understand about students with learning differences and how they can provide support and accommodations.
Prerequisite: admissionto SDEP program. .

## SpEd 573 - Assessment and Planning for Students With

 Mild Disabilities (3)Examination and application of diagnostic and assessment instruments used to meas ure cognitive language abilities
and social/emotional functioning. Formal and informal methods of as sessment.
Prerequisite: $\operatorname{SpEd} 418 / 518$.
SpEd 575 - Braille III/Technology for the Visually Impaired (3)
Study of computer applications for visually impaired learners, including existing and proposed hardware and software that would improve accessibility to print information by visually impaired and blind students. Adaptations of existing technology, evaluation of its effectiveness.

Prerequisite: SpEd 540.
SpEd 576 - Visually Impaired Learner with Additional Disabilities (3)
Study of visually handic apped students with concomitant disabilities such as hearing impairments, mental retardation, and behavior dis orders. Emph as is on curricular adaptations, teaching strategies, and behavior management.
Prerequisite: $\mathrm{SpEd} 418 / 518$.
SpEd 577 -Interagency Collaboration (2)
Focuses on service coordination that unifies school personnel and community agencies to strategically use collective expertise to plan the transition fromschool to adult life with students and families for the development and well-being of youth. Strategies for effective leadership and community resource mapping are employed.

## SpEd 579 - Literacy in Early Intervention/Special Education (3)

Knowledge and skill development of early literacy, including early writing and spelling, for children, birth through age 8 , with special needs. Focuses on strategies to support early foundations of literacy, language concepts, vocabulary, phonological awareness, alphabetic understanding, letter-sound correspondence, phonics, reading comprehension. Emphasizes collaboration of families and profes sionals.

## SpEd 580 - Introduction to Early Intervention/Early Childhood Special Education (3)

Provides historical, social, and legal foundations forearly intervention and early childhood special education and other services to young children with special needs. Introduces concepts and processes for screening and assessment, family-centered planning, blending developmentally and individually appropriate practices, providing learning opportunities in natural early childhood settings, planning environments and activities to include all
children, and transition planning. Expected preparation: admission to programor permission of instructor.

Also offered for undergraduate-level credit as SpEd 480 and may be taken only once for credit. .

## SpEd 581 -Family Guided Early Intervention (3)

Develops knowledge and skills necessary for providing early intervention services to infants and toddlers with developmental delay/disabilities and their families.
Also offered for undergraduate-level credit as SpEd 481 and may be taken only once for credit.

## SpEd 582 -SpecializedTechniques: Early Intervention/Early Childhood Special Education (3)

Develops specialized knowledge and skills necessary for providing early intervention and early childhood special education services to infants, toddlers, and preschool children with severe and multiple disabilities, including children with physical and sensory impairments, children with health impairments, and children with autism.

Also offered for undergraduate-levelcredit as SpEd 482 and may be taken only once fror credit.

SpEd 583 - Communication and Language Development: EI/SE (Early Intervention/Early Childhood Special Education) (3)

Designed to provide information about typical and atypical communication development, birth through early childhood. In addition, information will include strategies for EI/SE to promote communication development for all children. Expected preparation: SpEd $480 / \mathrm{SpEd} 580$ and admission to program.

Also offered for undergraduate-level credit as SpEd 483 and may be taken only once for credit. .

## SpEd 584 -Assessment: EI/SE (3)

Provides an overview of as sessment procedures in the field of early intervention/early childhood special education. These procedures include screening and testing using norm-referenced, criterion-referenced, curriculum-based, and observational methods. Reliability and validity of assessments are discussed in relation to standardized testing. Learners have the opportunity to observe and record the behaviors of young children. Assessment strategies such as arena assessment, play-based as sessment, parentreporting, and family interviewing. Emphas is on the assessment process for the young child and the family's role in the assessment of the young child with developmental delays or dis abilities.

## SpEd 585 - Instructional Strategies I: EI/SE (3)

Develops knowledge and practices for teaching and facilitating development of children with special needs,
birth through the primary grades. Builds upon the student's knowledge of child development and developmentally appropriate practices. Focuses upon the design of individually appropriate practices, principles of applied behavior analysis, activity-based intervention, naturalistic teaching strategies, dis crete trial teaching, and positive behavioral supports. Develops knowledge and skills for curriculum-based assessment, design of individual programplans, and use of data collection systems to monitor child progress.

## SpEd 586 - Instructional Strategies II: EI/SE (3)

Develops advanced knowledge and practices for teaching and facilitating development of children with special needs, birth through the primary grades. Builds upon the student's knowledgeof individually appropriate practice, applied behavior analysis, and design of individual and group plans for instruction. Develops knowledge and skills for implementation of specific strategies supported by current research and recommended practices, including strategies to support early relationships, peer interaction, social-emotional development, cognitive development, and early literacy.

## SpEd 587 - Introduction to Infant Toddler Mental Health (3)

Introductory course linking theory, research, and practice with interdisciplinary principles and collaboration. Key concepts of mental health of children (birth through 36 months) and their families including attachment, temperament, social-emotional development, context of family, culture and community, risk and resilience. Practices related to observation, screening, assessment, diagnosis; treatment.
Also offered for undergraduate-level credit as SpEd 487 and may be taken only once forcredit.

## SpEd 594 - Assessment Methods and Classification in Infant Mental Health (3)

Develop knowledge and skills to complete the as sessment process of infants, toddlers and their caregivers through multiple sources of information within a culturally relevant context. Topics include selection of tools and methods for information collection, methods for screening and as sessment, and use of classification systems within the mentalhealth system.

## SpEd 595 - Prevention and Intervention in Infant Mental Health (3)

Concepts of early intervention and prevention with the infant-toddler mental health perspective. Examines the range of interventions used in the field of infant mental
health. Emphas is on the importance of treating infants and toddlers in the context of their families and communities. Intervention strategies for those targeted at children with psychosocial/relational and developmental dis turbances as well as those determined to be at risk. Includes a review of international, national, and regional establis hed and pilot programs in early intervention and prevention. Assess and critically evaluate the current science around treatment efficacy of various interventions.

## SpEd 596 - Topics in Special Education Research (3)

Specialized topics in special education focused on the scientific process and the development of research-based practice. Research regarding theories, interventions, instructional strategies, curriculum, and assessment are examined for each topic. Sections address topics such as: Literacy, English Language Learners, Positive Behavior InterventionSupports and Students with Significant Dis abilities.

## SpEd 597 -Topics in Special Education Issues and Practices (3)

Specialized topics in special education focused on is sues and practices in the education of students with dis abilities. Current practices and issues, evidence-based practices, the use of research and assessment to understand problems, and the implementation and evaluation of interventions are examined for each topic. Topics such as the following are included: Literacy, English LanguageLearners, Positive Behavior Intervention Supports, Students with Significant Dis abilities.

## SpEd 601 -Research (1-9)

(Credit to be arranged.)

## SpEd 602 -Independent Study (1-9)

(Credit to be arranged.)

## SpEd 603 -Dissertation (1-16)

(Credit to be arranged.)

## SpEd 604 -Cooperative Education/Internship (1-9)

(Credit to be arranged.)

## SpEd 605 - Reading and Conference (1-9)

(Credit to be arranged.)

## SpEd 606 -Special Problems (1-9)

(Credit to be arranged.)

SpEd 607 - Seminar (1-9)
(Credit to be arranged.)

SpEd 608 - Workshop(1-9)
(Credit to be arranged.)

SpEd 609-Practicum(1-9)
(Credit to be arranged.)

## SpEd 610 -SelectedTopics (1-9)

(Credit to be arranged.)

## SpEd 801 - Research (0-9)

(Credit to be arranged.)

SpEd 802 - Independent Study (0-9)
(Credit to be arranged.)

SpEd 804 - Cooperative Education/Internship (0-9)
(Credit to be arranged.)

## SpEd 805 - Reading and Conference (0-9)

(Credit to be arranged.)

SpEd 806 -Special Problems (0-9)
(Credit to be arranged.)

SpEd 807 -Seminar (0-9)
(Credit to be arranged.)

SpEd 808-Workshop(0-9)
(Credit to be arranged.)

## SpEd 809 -Practicum(0-9)

(Credit to be arranged.)

SpEd 810 - Experimental Course (0-9)
(Credit to be arranged.)

## SpHr - Speech \& Hearing Sci

SpHr 199 -Special Studies (0-15)
(Credit to be arranged.)

## SpHr 222 - Introduction to Speech, Language \& Hearing Sciences (4)

An overview of the field of speech, language and hearing sciences and its professions. Focus on the scientific bas is of speech production, hearing perception and speech acoustics. Foundational information regarding language science will also be addressed. Emphasis on the scientific analys is of speech and language, with an applied clinical focus.

## SpHr 262 - Voice and Diction (4)

Study and practice of principles of voice production and articulation of speech sound, with attention to elementary speech physiology and phonetics. Intended for students who desire to develop more effective speech and for meeting special needs of teachers, radio and television speakers, public speakers, and others who require special competence in speaking. Emphasis on both theory and practice. Two hours per week of laboratory work required.

SpHr 365U-Survey of Speech, Language, and Hearing Disorders (4)
Designed as an overview of speech, language, and hearing in children and adults. Topics to include: cleft palate, stuttering, hearing impairment, and multi-cultural differences. Recommended for general speech students.

## SpHr 370-Phonetics and Acoustics (4)

A study of sounds used in speech, their acoustic properties, and their transcription utilizing the IPA; description of sounds, their symbolic nature, their production, and physical and psychological problems involved in their perception. The acoustical bases of speech and hearing will also be addressed.

SpHr 371 - Anatomy and Physiology of Speech and Swallowing (4)

A study of the anatomy and physiology of the res piratory, phonatory, and articulatory systems for speech, with applications to speech disorders. The physiology of swallowing and s wallowing disorders is also covered.

## SpHr 372U- Speech and Language Development in Children (4)

Provides students with a foundation of knowledge regarding basic processes of language acquisition. In addition to the study of normal language development from a theoretical, developmental, and clinical perspective, related areas of study include cognition, social interactions, play, and literacy. Bilingual and multicultural is sues are also addressed.

## SpHr 385 - AutismSpectrum Disorders (4)

Examines current is sues related to diagnosis and intervention for children and adolescents with autism spectrumdis orders (ASD). It focuses on current research related to theories of development across varied domains (social and communicative, motor, sensory, cognitive and adaptive behaviors) and interdisciplinary practice for serving children with ASD.

## SpHr 394 - Guided Observation (1)

Designed to acquaint students with theclinical process in speech, language, and audiology cases. Students will observe phases of clinical operation including diagnostic management, parent conferencing, and material preparation.

## SpHr 395-Directed Clinical Assistantship (2)

Designed to acquaint pre-professional students with the direct management of speech, language, and hearing cases $n$ cooperation with advanced clinicians and under the direction of a qualified clinical supervisor. Students will participate in all phases of clinicaloperation, including scheduling, diagnostic management, parentconferencing, report writing, material preparation.
Prerequisite: SpHr 370 ; may be taken in conjunction with $\mathrm{SpHr} 494,495$ or 496.

SpHr 399 - Special Studies (0-15)
(Credit to be arranged.)

## $\mathbf{S p H r} 401$ - Research (0-15)

(Credit to be arranged.) Consent of instructor. Use 501 to register forcomprehensive exams.

## SpHr 402 -Independent Study (1-12)

(Credit to be arranged.)

## SpHr 404-Cooperative Education/Internship (1-15)

(Credit to be arranged.)

## SpHr 405 -Reading and Conference (0-15)

(Credit to be arranged.) Consent of instructor.

## SpHr 406-Special Projects (1-8)

(Credit to be arranged.) Consent of instructor.

## SpHr 407 -Seminar (0-15)

(Credit to be arranged.) Consent of instructor.

## SpHr 408 -Workshop(0-15)

(Credit to be arranged.)

## SpHr 409 - Practicum(0-12)

(Credit to be arranged.) Students must show proof of professional liability insurance.

## SpHr 410 -SelectedTopics (0-12)

(Credit to be arranged.)

## SpHr 432 - Alternative Medicine (4)

This course offers a general introduction to influential medical systems (i.e., Traditional Chinese Medicine, Western Homeopathy, Indian A yurveda, etc.) in the world that are emerging in the U.S. as alternative medicines to the conventional (or allopathic) biomedicine. For s enior level and graduate students of all majors who are interested in health and medicine, including those who are preparing for medical or allied health professions like speechlanguage pathology.

SpHr 452 -Screening in the Schools (1)
Students will participate, under supervision, in screening school-aged students for speech, language, and/or hearing disabilities.
Also offered for graduate-level credit as SpHr 552 .
Prerequisite: 25 clock hours of practicum.
SpHr 461 - Neurology of Speech and Hearing (4)
A course specifically designed for speech and hearing majors to provide a study in-depth of the neurology of the speech and hearing mechanisms with special attention given to the majordeviations affecting verbal communication.
Also offered for graduate-level credit as SpHr 561 and may be taken only once for credit.

## SpHr 463 - Language Dis orders in Children (4)

An overview of developmental language disorders in children. Dis orders will be presented in terms of etiology, incidence, and characteristics. Assessment is sues and treatment principles will be discussed.
Prerequisite: SpHr 372 U .

## SpHr 464 - Speech Disorders in Children (4)

Discussion of normal speech development andhow it can differ in individuals with speech disorders. Exploration of assessment, diagnosis, and treatment for speech disorders in children. Introduction to linguistic and cultural factors related to speech development and disorders, and to special populations with high incidence of speech disorders.

Prerequisite: $\mathrm{SpHr} 370,372$. .

## SpHr 465 - Introduction to Research Methods for Clinical Scientists (4)

Covers designs and data interpretation methods used in clinical research. Validity threats are highlighted and discussed in the context of clinical studies. Focus on application of research principles in the evaluation of journal articles, with the goal of enabling students to critically review the literature.
Prerequisite: Stat 244 or Soc 396 or equivalent.

## SpHr 471 -Neurolinguistics (4)

Neurolinguistics introduces the study of the relationship between linguistic processes and the human brain. Learn about language processing frompsychological and neurological perspectives. Expected preparation: Introductory understanding of linguistics and psychology is strongly recommended (Introduction to Linguistics and Introduction to Ps ychology).
Also offered for graduate-level credit as SpHr 571 and may be taken only once for credit. Prerequis ite: SpHr 461 or equivalent.

## SpHr 473 -Perspectives on Disability (4)

Introduces students to perspectives on dis ability and ableism. Students will examine definitions of dis ability and the history of disability, particularly as it relates to communication and clinical practice. We will investigate the influence of media on perceptions of disability and discuss how models of disability influence approaches to service provision, communication choice, intervention, and education. These issues will be examined within the framework of how ableis mhas evolved and is expressed within society.

Also offered for graduate-level credit as SpHr 573 and may be taken only onceforcredit. Prerequisite: Upper-division standing.

## SpHr 475 - Introduction to the Professions of SpeechLanguage Pathology and Audiology (4)

Overview of topics related to professional development in speech-language pathology and audiology, including profes sional behavior, ethical res ponsibility, scope of practice, interdisciplinary collaboration, professional affiliations, continuumof care, typical work settings, and applying to graduate schools.
Prerequisite: senior standing.

## SpHr 480 - Introduction to Sociocultural Aspects of Interactions (4)

Introduction to communication and interaction on context and influence of context on communication disorders. Explores situational, social-interpersonal, and cultural variables. Examines systems theory and cultural practices as they influence communication.
Prerequisite: must be junior, undergraduate, or postbaccalaureate status.

SpHr 485 -Bilingualismand Communication Disorders (4)

Introduction to typical bilingual/bicultural development and communication dis orders. Addresses language, cognitive and social-emotional characteristics of bilingual children and adults with communication dis orders. Discussions on clinical challenges and general as sessment and intervention approaches when working with bilinguals with communication dis orders in SpeechLanguage pathology. Students participate in small group and class discussions, review related literature and participate in small projects.
Prerequisite: SpHr 372 U .

## SpHr 487 -Hearing Sciences (4)

Introductory course in audiology emphasizing basic acoustics and psychoacoustics, anatomy and physiology of the ear, hearing meas urement, and types and causes of hearing impairment.

Prerequisite: upper-division standing.
SpHr 488-Clinical Audiology (4)
Introduction to the audiological test battery. Topics include bone-conduction, masking, speech audiometry, and objective tests. Auditory pathologies and their audiometric correlates are also covered.

Prerequisite: SpHr 487 ; may be taken concurrently .

## SpHr 489 - Aural Rehabilitation (4)

Theoretical course covering the role of speechreading (lip reading) and auditory training as it relates to speech, language, and communication. Historical perspectives and philosophies considered, communication systems, speech acoustics and perception, amplification and hearing aids, speech reading, and auditory training. Multicultural issues will be included. Expected preparation: $\mathrm{SpHr} 488 / \mathrm{SpHr}$ 588.

Also offered for graduate-level credit as SpHr 589 and may be taken only once for credit.

## SpHr 490 - Audiological Rehabilitation Clinic (2)

Supervised clinical practicumin the diagnosis and rehabilitation of children and adults with hearing disabilities; staff seminars in case dispositions. Maximum: 18 credits. Recommended prerequisite: $\mathrm{SpHr} 489 / 589$, 498/598.

Also offered for graduate-level credit as SpHr 590.
SpHr 491 - Principles of Behavior Analysis: Clinical Applications (4)
The aim of this course is to examine key principles of behavior, including: assessment, behavior modification, and measurement. While the course will discuss how principles of behavior can be applied across all populations, specific attention will be given to individuals with communication challenges and how to be meet the needs of individuals with such challenges. Prerequisite: Upper-division standing.
Prerequisite: Upper-division standing.

## SpHr 495 -Neurogenic Communication Dis orders (4)

Introduction to speech and language disorders with emphas is on acquired neurogenic disorders due to stroke, traumatic brain injury, and neurodegenerative disorders (e.g., aphasia, dysarthria, right hemis phere syndrome).

Prerequisite: SpHr 461.

## SpHr 496 - Introduction to Clinical Management (4)

Provides an introduction to assessment and management of diverse persons with communication disorders across the lifespan. Covers basic principles of assessment and intervention, evidence-based practices, and behavior management. Introduces terminology and basic techniques
for addressing speech, language, and hearing disorders, with special consideration of programdesign and delivery.

Prerequisite: SpHr 371, 372. Expected Preparation: SpHr 370.

SpHr 501 - Research (0-15)
(Credit to be arranged.) Consent of instructor. Use 501 to register for comprehensive exams.

SpHr 502 - Independent Study (1-12)
(Credit to be arranged.)

## SpHr 503 -Thesis (0-9)

Consent of instructor. Must register for minimum of 6 credits total, with at least 1 credit in term of defense. (Credit to be arranged.)

## SpHr 504 - Cooperative Education/Internship (0-15)

(Credit to be arranged.)

## SpHr 505 - Reading and Conference (0-9)

(Credit to be arranged.) Consent of instructor.

## SpHr 506 -Special Projects (1-8)

(Credit to be arranged.) Consent of instructor.

SpHr 507 -Seminar (0-15)
(Credit to be arranged.) Consent of instructor.

## SpHr 508-Workshop(0-15)

(Credit to be arranged.)

## SpHr 509-Practicum(1-12)

(Credit to be arranged) Restricted to SpHrgraduate students only. Students must show proof of professional liability insurance.

## SpHr 510 -SelectedTopics (0-15)

(Credit to be arranged.)

## SpHr 530 - Evidence-based Practices in Communication Disorders (4)

Focuses on theevidence-based practices of as sessment and intervention in communication differences and dis orders. Specifically, principles of static and dynamic as sessment, intervention planning and implementation, goal writing and data collection-across communities and developmental stages. Emphas izes diversity, equity, and contextual influences on communication and social interaction. Restricted to graduate students.

Prerequis ite: SpHr 370 and SpHr 463.

## SpHr 540 - Multicultural Topics in Communication Disorders (2)

Introduces topics of communication dis orders within the framework of culture and identity. Explores cultural attitudes and beliefs about communication and dis abilities, cultural differences and cultural identity. May not be repeated forcredit.

## SpHr 541 - Bilingual Topics in Communication Disorders (2)

Explores current topics within bilingual speech and language development and dis orders. Covers typical and atypical development within many areas of speech and language, diagnostic criteria for determining disability, and as sessment and intervention topics for children and adults from bilingual language backgrounds. Emphas is on Spanish-English bilingual populations.

## SpHr 545 - Pathways to Professional Practice (2)

Overview of topics related to professional practice of speech-language pathology: professional organization membership, certification, licensure, and ethical and legal responsibilities. Career development is sues: preparing for national exams; résumé writing, interviewing, and planning for the Clinical Fellowship; teamcollaboration; supervision; and reimbursement practices.

Prerequisite: SpHr 530.

## SpHr 546 - Professional Ethics (2)

Enhances student awareness of and knowledge about ethical principles that form the basis for the American Speech-Language-Hearing Association Code of Ethics. Explores complexity of professional practice of SLP that have ethical considerations. Includes weekly group discussion to engage in ethical diagnosis using clinical scenarios based on individuals with communication disorders.
Prerequisite: SpHr 530.

## SpHr 552 -Screening in the Schools (1)

Students will participate, under supervision, in screening school-aged students for speech, language, and/or hearing dis abilities.
Also offered for undergraduate-level credit as SpHr 452. Prerequisite: 25 clock hours of practicum.

SpHr 553 -Counseling in Communication Disorders (2)
Presents approaches to counseling with emphasis on and implications for developing effective working relationships with clients with communication dis orders and their families. Presents techniques for effective therapeutic interventions. Students will explore and apply current interviewing and counseling strategies used for as sessment, treatment, and intervention in the practice of speechlanguage pathology.

Prerequisite: SpHr 530.
SpHr 554 -Advanced Speech Sound Dis orders: Theories and Application (4)
Development and disorders of speech sound production, with particularemphas is on children. Phonological and phonetic theories used in understanding speech and speech sound development and disorders. Various means of assessing and providing intervention for speech sound dis orders, including childhood apraxia of speech. Restricted to graduate students.

## SpHr 555 -Assessment and Treatment of Dysphagiain Adults ()

Introduction to dysphagia and related disorders in adults. Covers the following topics: 1) anatomy and physiology of swallowing; 2) types of acquired dysphagia; 3) clinical swallowing examination; 4) common methods of instrumental swallowing examination, including radiographic studies, fiber-endoscopic examinations and manometry; and 5) Dys phagia Intervention.

## SpHr 556 - Assessment and Treatment of Dysphagiain Pediatrics ()

Introduction to dysphagia and related disorders in children. Covers the following topics: 1) anatomy and physiology of swallowing; 2) types of acquired dysphagia; 3) clinical swallowing examination; 4) common methods of instrumental swallowing examination, including radiographic studies, fiber-endoscopic examinations and 5) Dysphagia Intervention.

SpHr 558 -Symbol Systems in Early Communication (2)

Focuses on communication characteristics of individuals with severe communication dis orders and their use of augmentative and alternative communication to meet both pre-intentional and intentional and symbolic communication needs. Emphas is on holistic communication assessment methods and intervention strategies to enhancecommunication in children.
Prerequisite: SpHr 530.

## SpHr 559 - Augmentative and Alternative Communication (2)

Introductory course in augmentative and alternative communication (AAC) with a focus on manual and technological communication methods. Includes strategies for appropriate assessment of speech, language, cognitive, and sensory-motor skills, and addresses partner support requirements for AAC use. Students gain knowledge and skills for treating children, adolescents, and adults with moderate to severe developmental or acquired disorders in speech and language.
Prerequisite: SpHr 530 of permis sion frominstructor.

## SpHr 560 - Research Methods in Communication Sciences andDisorders (4)

Introduction to research methods in communication sciences and dis orders. Covers research strategies and designs commonly used in communication sciences and disorders, as well as methods used in the collection, analys is and interpretation of data. The course focuses on the application of research principles in the critical evaluation of journal articles and other research literature, with the goal ofenabling students to make informed decisions as to which developments in communication disorders should be applied to clinical practice. The principles and processes of evidence-based, clinical practice are emphasized.
Prerequisite: Stat 243, 244 or equivalent.

## SpHr 561 - Neurology of Speech and Hearing (4)

A course specifically designed for speech and hearing majors to provide a study in-depth of the neurology of the speech and hearing mech anisms with special attention given to the major deviations affecting verbal communication.
Also offered for undergraduate-level credit as SpHr 461 and may be taken only once for credit.

## SpHr 562-Cognitive Rehabilitation (4)

Discus ses causes, symptoms, prevention, assessment, and management of cognitive-communication dis orders following acquired brain injury across the lifes pan. Specific populations to be discussed include traumatic
brain injury, stroke, and the dementias. Places emphasis on evidence-based clinical reas oning and applying the W orld Health Organization model to clinical management in rehabilitation settings. Restricted to graduate students.

## SpHr 563 - Adult Language Disorders (4)

Presents theories of acquired language dis orders in adults specific to aphasia rehabilitation, including causes, symptoms, prevention, as sessment, and management of aphasia in adults. Emphas is is placed onevidence-based clinical reasoning and applying the W orld Health Organization model to clinical management in a variety of rehabilitation settings.
Prerequisite: SpHr 461 . Restricted to graduate students.
SpHr 564 -Medical Speech-Language Pathology I (2)
Addresses current topics related to practice of medical speech-language pathology in a variety of settings. Topics may include management of tracheostomy/ventilator dependence; medical terminology; medicalbilling, reporting, and appeals; interdis ciplinary models; evidencebased practices; common medications and their side effects; and other topics of contemporary interest to learners.

Prerequisite: $\mathrm{SpHr} 461, \mathrm{SpHr} 562$, and SpHr 563.

## SpHr 566-Motor Speech Disorders (4)

Discusses dis orders of speech sensorimotor production, including causes, symptoms, prevention, assessment, and management of acquired apraxia of speech and the dysarthrias across the lifespan. Emphas is placed on evidence-based clinical reas oning and apply ing the W orld Health Org anization model to clinical management in varied settings.
Prerequisite: SpHr 530.

## SpHr 567 - Cleft and Craniofacial Disorders (2)

Provides in-depth clinical management of children with cleft lip and palate and other craniofacial syndromes. Particular emphas is placed on identification, description, as essment, and treatment of speech production, feeding, and psychosocial development. Explores evidence-based models of teamcare, including the role of other medical profes sionals.
Prerequisite: $\mathrm{SpHr} 370, \mathrm{SpHr} 371, \mathrm{SpHr} 530$, and SpHr 554.

## SpHr 568 - Medical Speech Pathology II (2)

Covers advanced topics pertinent to as sessment and treatment of speech and swallowing in individuals with respiratory impairments in a medical setting. Topics will include pulmonary function and defenses, types of res piratory impairments, tracheostomy, mechanical
ventilation, and selected speech and swallowing interventions for individuals with res piratory impairments.

Prerequisite:For current students in the Speech-Language Pathology Graduate Program, completion of SpHr 564 Medical SpeechPathology I is required. For practicing community clinicians with a Masters degreeor higher, no prerequisite is required.

## SpHr 570 - Audiometric Practicum (2)

Supervised clinical practice designed for Speech and Hearing Science majors. Practical training in basic puretone and speech audiometry, including audiometric screening of children and adults.
Prerequisite: $\mathrm{SpHr} 488 / 588$.

## SpHr 571 - Neurolinguistics (4)

Neurolinguistics introduces the study of the relationship between linguistic processes and the human brain. Learn about language processing fromps ychological and neurological perspectives. Expected preparation: Introductory understanding of linguistics and psychology is strongly recommended (Introduction toLinguistics and Introduction to Psychology).
Also offered for undergraduate-level credit as SpHr 471 and may be taken only once forcredit.

SpHr 573 - Perspectives on Disability (4)
Introduces students to perspectives on disability and ableism. Students will examine definitions of dis ability and the history of disability, particularly as it relates to communication and clinical practice. We will investigate the influence of media on perceptions of dis ability and discuss how models of dis ability influence approaches to service provision, communication choice, intervention, and education. These is sues will be examined within the framework of how ableismhas evolved and is expressed within society.
Also offered for undergraduate-level credit as SpHr 473 and may be taken only once for credit.
SpHr 581 -Stuttering (3)
Covers disorders of fluency, including causes, symptoms, prevention, theories of stuttering, as sessment, and management of stuttering in pediatrics and adults. Emphasis is placed on evidence-based clinical reasoning and applying the W orld Health Organization model to clinical management in a variety of practical settings.
Prerequis ite: SpHr 530.

## SpHr 582 - Voice Dis orders (3)

Presents advanced information about the anatomy and physiology of normal and dis ordered voice production, including causes, symptoms, prevention, assessment, and
management of voice disorders across the lifes pan for org anic and functional voice disorders.

Prerequisite: SpHr 530.

## SpHr 584 - Assessment and Treatment of Language Disorders: Birth to Age Five (4)

Focuses on causation, evaluation, and management for addressing communication dis orders in infants, toddlers, and preschool children with multiple challenges; particular emphasis on emerging communication across multiple developmental domains, with family-centered, interdis ciplinary assessment and intervention. Alltopics target use of evidence-based practices and the influence of context on performance.

## SpHr 585 - Assessment and Treatment of Language Disorders in School-aged Children and Adolescents (4)

Includes static, dynamic, and curriculum-based communication assessment of language, learning, and communication disorders. Discusses relation between language and learning dis abilities, with focus on treatment of language-based dis orders of reading and writing. Intervention emphasizes interdisciplinary service delivery models. Topics target use of evidence-based practices and influence of context on performance.
Prerequisite: SpHr 584.
SpHr 586-Autism (2)
Investigates current is sues related to diagnosis and intervention for children and adolescents with autism spectrumdis orders (ASD). Focuses on current research related to theories of social, communication, motor, sens ory, cognitive, and adaptive behavior development. Emphas izes interdisciplinary nature of serving children with ASD. Restricted to graduate students.

## SpHr 587 - Advanced Topics in Literacy in Children with Language Impairments (2)

Current topics specific to literacy disorders in children and adolescents with language impairment and other communication disorders. Specific topics may include review of typical literacy development, classification of literacy dis orders, perspectives in teaching literacy, and as sessment and intervention in areas including decoding, spelling, reading comprehension, digital literacy and written language.
Prerequisite: SpHr 585.

## SpHr 588 - Advanced Ass essment and Intervention for

 Bilinguals (2)This course is focused on clinical language assessment and intervention for bilingual, bicultural, and non-mainstream
populations within the field of speech-language pathology. Students learn how to select, administer and synthesize results fromvarious assessment tools (e.g., standardized normed-referenced, criterion-referenced tests, dynamic as sessment and parent interviews) to diagnose or rule out language impairment in bilinguals. Intervention goals and models are also addressed. While the course addresses several languages and cultures, it focuses on general principles.

## SpHr 589 - Aural Rehabilitation (4)

Theoretical course covering the role of speechreading (lip reading) and auditory training as it relates to speech, language, and communication. Historical perspectives and philosophies considered, communication systems, speech acoustics and perception, amplification and hearing aids, speech reading, and auditory training. Multicultural issues will be included. Expected preparation: $\mathrm{SpHr} 488 / \mathrm{SpHr}$ 588.

Also offered for undergraduate-level credit as SpHr 489 and may be taken only once for credit.

## SpHr 590 - Audiological Rehabilitation Clinic (2)

Supervised clinical practicumin the diagnosis and rehabilitation of children and adults with hearing disabilities; staff seminars in case dispositions. Maximum: 18 credits. Recommended prerequis ite: $\mathrm{SpHr} 489 / 589$, 498/598.
Also offered for undergraduate-level credit as SpHr 490.
SSc - Social Science: General
SSc 299 -Special Studies (1-6)
(Credit to be arranged.)

## SSc 601-Research (1-9)

(Credit to be arranged.)

## SSc 602 - Independent Study (1-9)

(Credit to be arranged.)

## SSc 603-Thesis (1-9)

(Credit to be arranged.)

## SSc 604-Cooperative Education/Internship (1-9)

(Credit to be arranged.)

## SSc 605 -Reading and Conference (1-9)

(Credit to be arranged.)

## SSc 606-Special Problems/Projects (1-9)

(Credit to be arranged.)

## SSc 607-Seminar (1-9)

(Credit to be arranged.)

## SSc 608-Workshop(1-9)

(Credit to be arranged.)

## SSc 609-Practicum(1-9)

(Credit to be arranged.)

## SSc 610-SelectedTopics (1-9)

(Credit to be arranged.)

## Stat - Statistics

## Stat 105 -Eementary Data Analysis (4)

A course in exploration of data analysis and basic statistical topics. May include descriptives tatistics, graphical and tabular summaries, computer software, confidence intervals, correlation and regression.
Prerequisite: Completion of Mth 95 with a grade of C- or above within the last year, or passing at the necessary level on the mathematics placement test within the last year(see Math Department webpage at mth.pdx.edu for information).

Stat 199 -Special Studies (1-4)
(Credit to be arranged.)

## Stat 241 - Application of Statistics for Business (4)

Introduction of statistical analysis as partof management practice. Content includes statistical analysis, theoretical foundations and tools, as they relate to the application of statis tics to problemsolving in uncertain business environments. Emphasizes application of statistical tools to real world datasets and ability of students to make managerial recommendations.

Prerequisite: Completion of Mth 95 with a grade of C- or above within the last year, or passing at the necessary level
on the mathematics placement test within the last year (see Math Department webpageat mth.pdx.edu for information).

## Stat 243 - Introduction to Probability and Statistics I

 (4)A bas ic course in statistical analysis including presentation of data, descriptive statistics, probability, probability distributions, sampling distributions, es timation, and use of statistical computer packages. A broad nontechnical survey designed primarily for non-math students who need to utilize the subject in theirown fields. Not approved for major credit. This is the first course in a sequence of two: Stat 243 and Stat 244 which must be taken in sequence.
Prerequisite: Completion of Mth 095 with a grade of C- or above within the last year, or pas sing at the necessary level on the mathematics placement test within the lastyear (see Math Department webpageat mth.pdx.edu for information).

Stat 243R-Recitation for Stat 243 (0)
Recitation forStat 243.
Corequisite:Stat 243.

## Stat 244 - Introduction to Probability and Statistics II

 (4)A basic course in statistical analysis including estimation, tests of significance, experimental design and analysis of variance, linear regression and correlation, nonparametric statistics, selected topics, applications, and use of statistical computer packages. A broad nontechnical survey designed primarily for non-math students who need to utilize the subject in theirown fields. Not approved for major credit. This is the second course in a sequence of two: Stat 243 and Stat 244 which must be taken in sequence.

Prerequisite: Stat 243.
Stat 244R-Recitation for Stat 244 (0)
Recitation forStat 244.
Corequisite: Stat 244.
Stat 299 -Special Studies (1-4)
(Credit to be arranged.)

## Stat 351 - Probability and Statistics for Hectrical and Computer Engineering (4)

An introduction to applied probability, statistics, and data analys is. Sample spaces, probability laws, discrete and continuous probability models, sampling theory, point and interval estimation, hypothesis testing, regression, correlation, experimental design, analysis of variance, computer simulation and computation in Matlab.

Applications to problems of current interest to electrical and computer eng ineers.

Prerequisite: Mth 252.

## Stat 353 - Exploratory Data Analysis and Statistics for Mechanical and Materials Engineering (4)

A statistics course with the main emphasis on understanding data frommechanicalengineering applications. Computer-based methods and the R software are used extensively. Descriptive statistics, probability and Bayes' Rule are introduced. Formal inference and hypothesis testing are presented with methods of regression and analysis of variance.
Prerequisite: Mth 252.

## Stat 361 - Introduction to Statistical Methods (4)

Calculus-based introductory statistics course. Introduction to probability concepts (random variables, probability distributions, expectation, variance, covariance) and statistical concepts (fundamental sampling distributions and data descriptions, one-sample estimation and testing problems).

Prerequisite: Mth 252.
Stat 363 -Statistical Computing and Data Visualization in $R$ (4)

Provides an introductory survey of methods in R, RStudio and R Markdown to process, manipulate, analyze, and visualize data; as well as to generate reproducible reports from a data driven analysis. Expected preparation: Prior programming experience is helpfulbut not required. We will be using the R language in RStudio and R Markdown for ease of exposition.
Prerequisite: Stat 361.

## Stat 364 - Modern Regression Analysis (4)

Foundations of statistical regression modeling and applications. Focus on application of statistical models. Topics include linear regression, multiple linear regres sion, model diag nosis, model selection and validation, and inference.

Prerequisite: Mth 343 and Stat 363.

## Stat 366 - Introduction to Experimental Design (4)

Nonparametric statistics, multiple regression, topics in experimental design analysis of variance, factorial designs, analys is of covariance, other designs.
Prerequisite: Stat 244.

## Stat 387 - Introduction to Statistical Learning (4)

Provides an introduction to the techniques of statistical learning, including assessing model accuracy, linear regression in high dimension, binary and multi-ary
classification, re-sampling methods, tree-based methods and neural networks.

Prerequisite: Stat 364.

## Stat 399-Special Studies (1-6)

(Credit to be arranged.)

## Stat 401 - Research (1-6)

(Credit to be arranged.) Consent of instructor.

## Stat 404 - Cooperative Education/Internship (1-12)

(Credit to be arranged.)

Stat 405 - Reading and Conference (1-8)
(Credit to be arranged.) Consent of instructor.

## Stat 407 -Seminar (1-4)

(Credit to be arranged.) Consent of instructor.

## Stat 409 - Practicum (1-12)

(Credit to be arranged.)

## Stat 410 -SelectedTopics (1-8)

(Credit to be arranged.) Consent of instructor.

## Stat 451 - Applied Statistics for Engineers and Scientists I(4)

Sample spaces, probability, counting measures, discrete and continuous probability models, sampling theory, and computer applications. This is the first course in a sequence of two: Stat 451 and Stat 452 and must be taken in sequence.

Also offered for graduate-level credit as Stat 551 and may be taken only once for credit. . Prerequisite: Mth 252 .

## Stat 452 - Applied Statistics for Engineers and Scientists II (3)

Point and interval estimation, hypothesis testing, regression, correlation, experimental design, analysis of variance, multivariable experiments, nonparametrics, statistical quality control, and computer applications. This is the second coursein a sequence of two: Stat 451 and Stat 452 and must be taken in sequence.

Also offered for graduate-level credit as Stat 552 and may be taken only once for credit. . Prerequisite: Stat 451.

## Stat 461 - Introduction to Mathematical Statistics I(3)

Theory of probability, distribution of random variables, expectation and bivariate distributions. This is the first course in a sequenceof three: Stat 461, Stat 462, and Stat 463 which must be taken in sequence. Expected preparation: MTH253.
Prerequisite: Mth 254 and Mth 261 or equivalent.

## Stat 462 - Introduction to Mathematical Statistics II (3)

Functions of randomvariables - one dimensional and higher dimens ional, s ampling dis tributions, Central Limit Theorem, point and interval estimation. This is the second course in a sequenceof three: Stat 461, Stat 462, and Stat 463 which must be taken in sequence.

Prerequisite: Stat 461 or equivalent.

## Stat 463 - Introduction to Mathematical Statistics III (3)

Testing of hy potheses, analy sis of variance, analysis of categorical data, introduction to regression and correlation and nonparametric tests. This is the third course in a sequence of three: Stat 461 , Stat 462 , and Stat 463 which must be taken in sequence.

Prerequisite: Stat 462 or equivalent.

## Stat 464 - Applied Regression Analysis (3)

Basic concepts of regression analysis, matrix approach to linear regression selecting the ?best? regression equation, and multiple regression. Computational algorithms and computer software regression packages. Applications in science, en gineering, and business.

Also offered for graduate-level credit as Stat 564 and may be taken only once for credit. . Prerequisite: Mth261 and eitherStat 451/Stat 551 or Stat 461/Stat 561.

## Stat 465 - Experimental Design: Theory and Methods I (3)

A theoretical and applied treatment of experimental design; analys is of variance, checking model adequacy; block designs; Latin squares; factorial designs; fractional factorial designs. All sections will illustrate real world applications with computer usage. This is the first course in a sequence of two: Stat 465 and Stat 466 which must be taken in sequence.
Also offered for graduate-level credit as Stat 565 and may be taken only oncefor credit. .Prerequisite: Stat 464/Stat 564.

## Stat 466 - Experimental Design: Theory and Methods II (3)

A theoretical and applied treatment of experimental design; fixed and randomeffects models; split-plot designs; nested designs; relation to regression analysis; analysis of covariance. All sections will illustrate real world applications with computer usage. This is the second course in a sequence of two: Stat 465 and Stat 466 which must be taken in sequence.
Also offered for graduate-level credit as Stat 566 and may be taken only once for credit. . Prerequisite: Stat 465/Stat 565.

## Stat 467 - Applied Probability I (3)

Basic concepts of probability, conditional probability, conditional expectation, dis crete-time Markov chains, branching processes, Poisson processes. This is the first course in a sequence of two: Stat 467 and Stat 468 which must be taken in sequence.
Also offered for graduate-level credit as Stat 567 and may be taken only once for credit. . Prerequisite: Stat 461/Stat 561 or Stat 451/Stat 551.

## Stat 468 - Applied Probability II (3)

Continuous-time Markov chains, birth and death processes, queues and inventory, renewal processes. This is the second course in a sequence of two: Stat 467 and Stat 468 which must be taken in sequence.
Also offered for graduate-level credit as Stat 568 and may be taken only once for credit. . Prerequisite: Stat 467.

## Stat 470 -Statistical Consulting (1-3)

Introduction to techniques and methods of statistical consulting. Faculty supervised consulting sessions with clients on appropriate projects brought to the Statistics Consulting Laboratory. Data and/or statistical problems, from within and outside the University, are provided by clients and interdisciplinary guest lecturers. Introduction to and proficiency with various statistical computing packages as dataanalytic tools. A community -based learning course.
Also offered for graduate-level credit as Stat 570 and may be taken only once for credit.

Stat 501 - Research (1-6)
(Credit to be arranged.) Consent of instructor.

## Stat 504 - Cooperative Education/Internship (1-12)

(Credit to be arranged.)

## Stat 505 - Reading and Conference (1-12)

(Credit to be arranged.) Consent of instructor.

## Stat 507 -Seminar (1-4)

(Credit to be arranged.) Consent of instructor.

## Stat 510 -SelectedTopics (1-8)

(Credit to be arranged.) Consent of ins tructor.

## Stat 543 - Survey of Statistical Methods (4)

An introductory, discipline-neutral course in statistical analys is to prepare graduate students for research methods courses in other departments. Topics include descriptive statistics, confidence intervals, hypothesis tests, regression and correlation, analysis of variance, chisquared tests, and use of statistical software.

## Stat 551 - Applied Statistics for Engineers and Scientists I(4)

Sample spaces, probability, counting measures, discrete and continuous probability models, sampling theory, and computer applications. This is the first course in a sequence of two: Stat 551 and Stat 552 and must be taken in sequence.
Also offered for undergraduate-level credit as Stat 451 and may be taken only once for credit. . Prerequisite: Mth 252.

## Stat 552 - Applied Statistics for Engineers and Scientists II (3)

Point and interval estimation, hypothesis testing, regression, correlation, experimentaldesign, analysis of variance, multivariable experiments, nonparametrics, statisticalquality control, and computer applications. This is the second course in a sequence of two: Stat 551 and Stat 552 and must be taken in sequence.
Also offered for undergraduate-level credit as Stat 452 and may be taken only once for credit. . Prerequisite: Stat 551.

## Stat 561 - Mathematical Statistics I (3)

Provides a foundation in the theory and methods of statistical inference. Topics include foundations of probability, randomvariables and distribution functions, moment generating functions, and common families of distributions. This is the first course in a sequence of three: Stat 561 , Stat 562 , and Stat 563 which must be taken in sequence.
Prerequisite: Stat 462 or equivalent.

## Stat 562 - Mathematical Statistics II (3)

Provides a foundation in the theory and methods of statistical inference. Topics include multivariate distributions, transformmethods, conditional dis tributions, covariance, distributions of sample statistics, and convergence theorems. This is the second course in a sequence of three: Stat 561, Stat 562, and Stat 563 which must be taken in sequence.
Prerequisite: Stat 561.

## Stat 563 - Mathematical Statistics III (3)

Provides a foundation in the theory and methods of statistical inference. Topics include point estimation, evaluating estimators, hypothesis testing, confidence intervals, and as ymptotic results for statistical tests. This is the third course in a sequence of three: Stat 561, Stat 562, and Stat 563 which must be taken in sequence.
Prerequisite: Stat 562.

## Stat 564 - Applied Regression Analysis (3)

Basic concepts of regression analysis, matrix approach to linear regression selecting the "best" regression equation, and multiple regres sion. Computational algorithms and computer s oftware regression packages. Applications in science, engineering, and business.
Also offered for undergraduate-level credit as Stat 464 and may be taken only once for credit. . Prerequisite: Mth 261 and either Stat 451/Stat 551 or Stat 461/Stat 561.

## Stat 565 - Experimental Design: Theory and Methods I (3)

A theoretical and applied treatment of experimental design; analys is of variance, checking model adequacy; block designs; Latin squares; factorial designs; fractional factorial designs. All sections will illustrate real world applications with computer usage. This is the first course in a sequence of two: Stat 565 and Stat 566.
Also offered for undergraduate-level credit as Stat 465 and may be taken only once for credit. . Prerequisite: Stat 464/Stat 564.

## Stat 566 - Experimental Design: Theory and Methods II (3)

A theoretical and applied treatment of experimental design; fixed and randomeffects models; split-plot designs; nested designs; relation to regression analysis; analysis of covariance. All sections will illustrate real world applications with computer usage. This is the second course in a sequence of two: Stat 565 and Stat 566.
Also offered for undergraduate-level credit as Stat 466 and may be taken only once for credit. . Prerequisite: Stat 465/Stat 565.

## Stat 567 - Applied Probability I (3)

Basic concepts of probability, conditional probability, conditional expectation, dis crete-time Markov chains, branching processes, Pois son processes. This is the first course in a sequenceof two: Stat 567 and Stat 568 which must be taken in sequence.

Also offered for undergraduate-levelcredit as Stat 467 and may be taken only once for credit. . Prerequisite: Stat 461/Stat 561 or Stat 451/Stat 551.

## Stat 568 - Applied Probability II (3)

Continuous-time Markov chains, birth and death processes, queues and inventory, renewal processes. This is the second course in a sequence of two: Stat 567 and Stat 568 which must be taken in sequence.

Also offered for undergraduate-level credit as Stat 468 and may be taken only once for credit. . Prerequisite: Stat 567.

## Stat 570 - Statistical Consulting (1-3)

Introduction to techniques and methods of statistical consulting. Faculty supervised consulting sessions with clients on appropriate projects brought to the Statistics Consulting Laboratory. Dataand/orstatistical problems, from within and outside the University, are provided by clients and interdisciplinary guest lecturers. Introduction to and proficiency with various statistical computing packages as data analytic tools. A community-based learning course.
Also offered for undergraduate-level credit as Stat 470 and may be taken only once for credit.

## Stat 571 - Applied Multivariate Statistical Analysis (3)

Introduction to techniques and methods of multiv ariate statistical analysis. Deals with vector-valued data generated on individual experimental units. Applies the methods of vector analysis and matrix algebra to statistical problems of estimation and hypothesis testing, based primarily on the multivariate normal distribution. Computing to be an integral part of the course. Calculations will be done using a software package such as SAS or SPSS. Recommended prerequisites: Stat 244, Mth 254, and Mth 261.

## Stat 572 - Bayesian Statistics (3)

Modern applied Bayesian methods including Markov Chain Monte Carlo methods for analyzing multivariate posterior distributions. Computing will be done primarily in R using standard libraries for sampling.
Prerequisite: Stat 561 or instructor approval.
Stat 573 - Computer Intensive Methods in Statistics (3)
Resampling methods in statistics using empirical data, programming with statistical software, review materials
(sampling dis tributions, hypothesis testing, confidence interval construction, and design of experiments), resampling version of review materials, and applications. Expected preparation: Stat 452/Stat 552 or Stat 466/Stat 566.

## Stat 576 - Sampling Theory and Methods (3)

Introduction to the theory and methodology of random sampling. Includes stratified, cluster, systematic, and multi-s tage sampling. Applications include sampling design and analysis, as well as sample weighting and sampling with unequal probabilities. Expected preparation: Stat 451/Stat 551.

## Stat 577 - Categorical Data Analysis (4)

Topics include cross-tabulation statistics for matched samples, and methods to assess confounding and interaction via stratified tables. Students explore logistic regression in some detail, and relate results back to those found with stratified analyses. Topics for logis tic regression will include: parameter interpretation, statistical adjustment, variable selectiontechniques, and modelfit as sessment. Statistical software is used. Expected preparation: Stat 452/Stat 552.

## Stat 578 -Survival Analysis (3)

Time-to-event data subject to randomand/or deliberate censoring. Specialized models and procedures that accommodate censoring are presented. Parametric models and methods, including accelerated failure time models, the Kaplan-Meier estimateof survival, Coxproportionate hazards model, the extended Cox model, and frailty models. Software package such as S-PLUS is used. Expected preparation: Stat 452/Stat 552.

## Stat 580 - Nonparametric Methods (3)

Focus on standard nonparametric methods useful for the analys is of experimental data with minimal model as sumptions. Topics include one and two-sample problems, one and two-way analysis of variance, multiple comparis ons, rank correlation, estimation and confidence intervals, theory of U-s tatistics, permutation tests, Bootstrap, Monte Carlo powersimulation studies.
Prerequisite: Stat 562 or with the approval of the Instructor.

## Stat 601 - Research (1-9)

(Credit to be arranged.)

## Stat 604 - Cooperative Education/Internship (1-12)

(Credit to be arranged.)

## Stat 605 - Reading and Conference (1-8)

(Credit to be arranged.)

## Stat 607-Seminar (1-4)

(Credit to be arranged.)

## Stat 610 -SelectedTopics (0-4)

(Credit to be arranged.)

## Stat 661 - Advanced Mathematical Statistics I(3)

Theory of estimation; tests of statistical hypotheses. Single and multi-parameter cases. Robustness. Classical notions, including lower bound theory, sufficiency, and maximum likelihood estimation. The Neyman-Pearson construction, likelihood ratio tests, robust analogues. Recommended prerequisites: Mth511, Stat 563.

## Stat 662 - Advanced Mathematical Statistics II (3)

Theory of estimation; tests of statistical hypotheses. Single and multi-parameter cases. Robustness. Classical notions, including lower bound theory, sufficiency, and maximum likelihood estimation. The Neyman-Pearson construction, likelihood ratio tests, robust analogues. Recommended prerequisites: Mth511, Stat 563.

## Stat 663 - Advanced Mathematical Statistics III (3)

Theory of estimation; tests of statistical hypotheses. Single and multi-parameter cases. Robustness. Classical notions, including lower bound theory, sufficiency, and maximum likelihood estimation. The Neyman-Pearson construction, likelihood ratio tests, robust analogues. Recommended prerequisites: Mth511, Stat 563.

## Stat 664 - Theory of Linear Models I (3)

Multivariate normal distribution; moments and characteristic functions; noncentral Chi-square and noncentral F distributions; dis tribution of quadratic forms; estimation and distribution of estimators; principles of maximum likelihood and least squares; confidence regions and tests of hypotheses; regression models; Wishart dis tribution; Hotelling's T2 statistic. This is the first course in a sequence of three: Stat 664, Stat 665, and Stat 666
which must be taken in sequence. Recommended prerequisite: Stat 563.

## Stat 665 - Theory of Linear Models II (3)

Multivariate normal distribution; moments and characteristic functions; noncentral Chi-square and noncentral $F$ distributions; distribution of quadratic forms; estimation and dis tribution of estimators; principles of maximum likelihood and least squares; confidence regions and tests of hypotheses; regression models; Wishart distribution; Hotelling's T2 statistic. This is the second course in a sequence of three: Stat 664, Stat 665, and Stat 666 which must be taken in sequence. Recommended prerequisite: Stat 563.

## Stat 666 - Theory of Linear Models III (3)

Multivariate normal distribution; moments and characteristic functions; noncentral Chi-square and noncentral $F$ distributions; distribution of quadratic forms; estimation and dis tribution of estimators; principles of maximum likelihood and least squares; confidence regions and tests of hypotheses; regression models; Wishart distribution; Hotelling's T2 statistic. This is the third course in a sequence of three: Stat 664, Stat 665, and Stat 666 which must be taken in sequence. Recommended prerequisite: Stat 563.

## Stat 671 - Statistical Learning I(3)

Bayesian theory of classification, the bias/variance tradeoff, linear and quadratic discriminant analysis, Bayesian logistic regression, neural networks, Gaussian processes and structured learning. This is the first course in a sequence of three courses on Statistical Learning: Stat 671, Stat 672, Stat 673.

Prerequisite: Stat 561 and Stat 562 and Stat 563.
Stat 672 - Statistical Learning II (3)
Bayesian networks, k-means, mixture models, the expectation maximization algorithm, Markov random fields, Gibbs distributions, belief propagation algorithms, variational inference, Markov chain Monte Carlo. This is the second course in a sequence of three courses on StatisticalLearning: Stat 671, Stat 672, Stat 673.
Prerequisite: Stat 561 and Stat 562 and Stat 563.
Stat 673 -Statistical Learning III (3)
This sequence is designed for graduate students in Math/Stat or Engineering. The focus of this third course is research topics in statistical learning to be determined each time this course is taught. This is the third course in a
sequence of three courses on Statistical Learning: Stat 671, Stat 672, Stat 673.

Prerequisite: Stat 561 and Stat 562 and Stat 563.

## Swah - Swahili

These courses are currently inactive and the department is not planning offer themthis year.

## Swah 101 - First-Year Swahili Term1 (4)

Introduction to elementary Swahili. Emphasis on listening comprehension, and oral practice, the elements of grammar, vocabulary building, andelementary readings. This is the first course in a sequence of three: Swah 101, Swah 102, and Swah 103.

## Swah 102 -First-Year Swahili Term 2 (4)

Introduction to elementary Swahili. Emphasis on listening comprehension, and oral practice, the elements of grammar, vocabulary building, and elementary readings. This is the second course in a sequence of three: Swah 101, Swah 102, and Swah 103.

## Swah 103 -First-Year Swahili Term 3 (4)

Introduction to elementary Swahili. Emphasis on listening comprehension, and oral practice, the elements of grammar, vocabulary building, andelementary readings. This is the third course in a sequence of three: Swah 101, Swah 102, and Swah 103.

## Swah 201 -Second-Year S wahili Term 1 (4)

Intensive review of basic materials introduced in first year programand further development of communication skills. This is the first course in a sequence of three: Swah 201, Swah 202, and Swah 203. Expected preparation: Swah 103.

## Swah 202 -Second-Year S wahili Term 2 (4)

Intensive review of basic materials introduced in first year programand further development of communication skills. This is the second course in a sequence of three: Swah 201, Swah 202, and Swah 203. Expected preparation: Swah 103.

## Swah 203 -Second-Year S wahili Term 3 (4)

Intensive review of basic materials introduced in first year programand further development of communication skills. This is the third course in a sequence of three: Swah 201,

Swah 202, and Swah 203. Expected preparation: Swah 103.

## Swah 301 - Third-Year Swahili (4)

Focus on acquisition of vocabulary, practical application. Intensive practice in speaking, listening, reading, and writing. This is the first course in a sequence of three: Swah 301, Swah 302, and Swah 303. Expected preparation: Swah 203.

## Swah 302 - Third-Year Swahili (4)

Focus on acquisition of vocabulary, practical application. Intensive practice in speaking, listening, reading, and writing. This is the second course in a sequence of three: Swah 301, Swah 302, and Swah 303. Expected preparation: Swah 203.

## Swah 303 - Third-Year Swahili (4)

Focus on acquisition of vocabulary, practical application. Intensive practice in speaking, listening, reading, and writing. This is the third course in a sequence of three: Swah 301, Swah 302, and Swah 303. Expected preparation: Swah 203.

## Swah 330 - Topics in East African Culture and Civilization (4)

A study of literary forms, theories, and analysis of texts in their socio-cultural contexts. Topics include: Oral literature, folklore, short stories, traditions and modernity, and biographies. Conducted in English.

## Swah 331 -Language, Literacy and Leadership: A Community BasedLearning Course (4)

Students learn by helping students fromother cultures (e.g. Swahili) succeed in the US. Through classroomstudy and community involvement, students obtain knowledge and skills applicable to societalproblems. Students will tutor individuals and small groups while gaining an understanding of other communities and their challenges.

## Swah 399 - Special Studies (1-6)

(Credit to be arranged.)

## Swed - Swedish

## Swed 101 -First-Year Swedish Term 1 (4)

Beginning Swedish. Emphasis on communication skills: listening, speaking, reading, writing. This is the first course in a sequence of three: Swed 101, Swed 102, and Swed 103.

## Swed 102 -First-Year Swedish Term 2 (4)

Beginning Swedish. Emphasis on communication skills: listening, speaking, reading, writing. This is the second course in a sequenceof three: Swed 101, Swed 102, and Swed 103.

## Swed 103 -First-Year Swedish Term 3 (4)

Beginning Swedish. Emphasis on communication skills: listening, speaking, reading, writing. This is the third course in a sequenceof three: Swed 101, Swed 102, and Swed 103.

## Swed 199 -Special Studies (1-5)

(Credit to be arranged.)

## Swed 201 -Second-Year Swedish Term 1 (4)

Intensive review of basics introduced in first-year courses and further development of communication skills. This is the first course in a sequence of three: Swed 201, Swed 202, and Swed 203. Recommended prerequisite: Swed 103.

## Swed 202 -Second-Year S wedish Term 2 (4)

Intensive review of basics introduced in first-year courses and further development of communication skills. This is the second course in a sequence of three: Swed 201, Swed 202, and Swed 203. Recommended prerequisite: Swed 103.

## Swed 203 -Second-Year Swedish Term 3 (4)

Intensive review of basics introduced in first-year courses and further development of communication skills. This is the third course in a sequence of three: Swed 201, Swed 202, and Swed 203. Recommended prerequisite: Swed 103.

## Swed 299 - Special Studies (1-5)

(Credit to be arranged.)

## SW - Social Work

## SW 301U- Introduction to Social Work (4)

This course introduces the student to the profession of social work and the field of social welfare through a historical lens. This course provides the student with the foundational language, principles of social work and introduces the student to the BSW Program. It will include introduction and overview of the knowledge, values, and skills of becoming a professional generalist social worker.

## SW 320U- Introduction to Child Welfare (4)

An overview of the child welfare systems. Introduction to the identification, treatment of child abuse and neglect. Present his torical and current development of child welfare systems in the United States, discussion of the key practice considerations human service professionals working with maltreated children and their families address.

## SW 339 - Introduction to Oppression and Privilege (4)

Introduction and exploration of diversity, oppression and privilege frameworks; intersectionality regarding the dynamics of race, ethnicity, gender, sexual orientation, religion, (dis) ability status, and class. The course will focus on theory, knowledge, values, and beginning skills to work with individuals in the area of socialjustice and social work. The course will have relevant knowledge, values, and skills pertaining to acquiring theBASW.

Prerequisite: Admis sion to major.

## SW 340 - Advocacy for Policy Change (4)

Current structures and history of social welfare policies and services will be examined, and students will be engaged in policy practice to advance social and economic well-being of families, groups and communities.
Prerequisite: Admis sion to major, junior standing, SW 339.

## SW 341 -Social Justice Practice (4)

Engages in generalist social work policy practice to advance social and economic well-being and to deliver effective social work services through the lens of social justice.
Prerequisite: admis sion to major; junior standing; SW 339, SW 340, SW 350.

## SW 350 - Human Behavior Through the Lifespan (4)

Theoretical and conceptual foundations of working with individuals and families throughoutthe lifespan in profes sional and community settings. His torical and sociopolitical is sues will be integrated with theory to prepare beginning generalist social workers for effective practice in a variety of contexts.
Prerequisite: Admission to the major, junior standing, SW 339.

## SW 351 -Social Work Practice I (4)

This is the first course in a four-course sequence, Social Work Practice I-IV, which prepares students to work with individuals, families, groups, and communities. Successful completion of this course is required for students to enter a field placement in their senior year (SW 400).

Prerequisite: SW 339, SW 340, SW 350.

## SW 375 - Intimate Partner Violence: Theories \& Practices (4)

Introduces theories, interventions, res earch, and complex is sues associated with intimate partner violence (IPV). Survey popular/unpopular theories used to understand and explain IPV. Explores range of interventions targeting individuals communities used by diverse stakeholders. While most IPV interventions engaged by soc serv providers target micro practice, students will explore the intersections of micro macro violence to betterunderstand the influence of state and structural violence on the lives of individuals communities, particularly those from racialized groups.

## SW 384U- Addictions and Recovery: Impact on Families and Communities (4)

The impact of addictions will be addressed through the literature and practices of psychology, sociology, medicine, and social work. We will explore the definitions of substance abuse and paths to recovery mediated by the influence of social, cultural, and political forces impacting individuals, families, and communities.
Prerequisite: Upper-division standing.
SW 399 -Special Studies (1-4)
(Credit to be arranged.)

## SW 399U- Special Studies (4)

(Credit to be arranged.)

## SW 400 - Field Placement and Seminar I-III (4)

This course is the 9-month agency-based field placement and concurrent field seminar where students apply generalist social work knowledge, values, and develop generalist social work skills. The supervised field placement and weekly field seminar facilitate a student's application of social work practice skills, the integration of theoretical content and the development of critical thinking skills. This course is a core component of the BSW curriculum, allowing students to apply knowledge gained in their social work courses in real world practice settings.

Corequisite: Corequisites: SW 430, SW 431 and SW 432.

## SW 401 - Research (1-12)

(Credit to be arranged.)

SW 402 - Independent Study (1-12)
(Credit to be arranged.)

## SW 403 - Thesis (1-4)

(Credit to be arranged.)

## SW 404 - Internship(1-8)

Contact the department for a description for this course.

## SW 405 - Reading and Conference (1-6)

(Credit to be arranged.) Consent of instructor.

SW 406-(1-12)

## SW 407 -Seminar (1-6)

(Credit to be arranged.) Consent of instructor.

## SW 409 - Practicum(1-12)

(Credit to be arranged.)

## SW 410 -Selected Topics (1-6)

(Credit to be arranged.)

## SW 416-Motivational Interviewing (4)

Hands on practice intensive course teaches the central theoretical and empirical tenets of Motivational

Interviewing (MI), as wellas the clinical skills neces sary to deliver the intervention to a wide range of clients in diverse settings. Students will learn and practice both the spirit and techniques of motivational interviewing.
Prerequisite: Upper Division or Post-Bac standing.

## SW 430 -Social Work Practice II (3)

This is the second course in a four-course sequence, Social Work Practice I-IV, which prepares students to work with individuals, families, groups, and communities. BSW students take this sequence concurrently with their field placement.

Prerequisite: Admission to the major and SW 351. Corequisite: SW 400.

## SW 431 -Social Work Practice III (3)

The third course in a four-course sequence, Social Work Practice I-IV, which prepares students to work with individuals, families, groups, and communities. BSW students take this sequence concurrently with their field placement.

Prerequisite: SW 351 and SW 430. Corequisite: SW 400.

## SW 432 -Social Work Practice IV (3)

This is the fourth course in a four-course sequence, Social Work Practice I-IV, which prepares students to work with individuals, families, groups, and communities. BSW students take this sequence concurrently with their field placement.

Prerequisite: SW 431. Corequisite: SW 400.
SW 441 -Ps ychobiology for Social Workers (3)
Provides baccalaureate level social workers with a bas ic understanding of biological concepts, physiological systems, and neurological-environmental interactions. Enhances social work practice skills by providing a holistic conceptualization of people-in-environment.
Prerequisite: Admission to major.

## SW 447 -Social Work andSustainability (3)

Examines the role of profes sional social work in achieving sustainability at individual, community, regional, national, and global levels. Using a multidisciplinary perspective, the environmental, economic, and social aspects of sustainability, considered theoretically and practically. Sustainability linked to attainment of environmental, economic, and socialjustice. Includes community-based learning projects addressing sustainability.

Removing dual-level cross-listing. Prerequisite: SW 440 or equivalent.

## SW 450 - Social Work Research andEvaluation I (3)

The importance of social work research and evaluation for practice and policy. Qualitative and quantitative research, critical consumption of research, and conducting evaluations. Focuses on research that promotes social and economic justice and that encourages respect for diversity. Includes experimental designs, single systemdesigns, focus groups, and interviews. Covers early phases of the research process: conceptualization, design, sampling, measurement, and data collection. Emphasizes ethical issues.

Prerequisite: Admis sion to major; SW 351.

## SW 451 - Social Work Research andEvaluation II (3)

Teaches next phases of the research and evaluation process: data analy sis, formulation of implications of findings, and dissemination. Critical consumption of research findings as well as conducting dataanalysis. Qualitative and quantitative data analysis, including descriptive statistics, hypothesis testing, data analysis of single system designs, and thematic analysis. Focuses on research and evaluation that promote social and economic justice and that encourage respect for diversity.
Emphasizes ethical is sues.
Prerequisite: Admis sion to major; SW 450.

## SW 465 - Introduction to Indian Child Welfare and the Indian Child Welfare Act (4)

Introduction to Indian child welfare with an emphasis on understanding legal, historical, and cultural issues applying to work with American Indian and Alaskan native youth. Emphasis is on Indian child welfare issues in the Pacific Northwest.

## SW 501 - Research (1-9)

(Credit to be arranged.)

## SW 502 -Laboratory (1-9)

(Credit to be arranged.)

## SW 503 - Thesis I, II III (1-9)

(Credit to be arranged.)

## SW 504 - Cooperative Education/Internship (0-15)

(Credit to be arranged.)

## SW 505 - Reading and Conference (1-6)

(Credit to be arranged.)

## SW 506 -Special Problems (1-6)

(Credit to be arranged.)

## SW 507 -Seminar (1-6)

(Credit to be arranged.)

## SW 508 - Workshop(1-6)

(Credit to be arranged.)

## SW 509 - Practicum(1-9)

(Credit to be arranged.)

## SW 510 -SelectedTopics (1-6)

(Credit to be arranged.)

## SW 511 - Field Seminar and Field Placement (1-4)

Engage in 9-month agency-based generalist field internship and concurrent weekly seminar. Apply knowledge gained in social work courses and build skills in real-world practice settings, while concurrently synthesizing field learning with peers in discussion-based seminar to explore what it means to be a social worker; reflect on how their identities, use of power, definition of profes sionalism, use of supervision, engagement with ethics, and conceptualization of social worker well-being inform their approach to social work practice.

## SW 512 -Advanced Field Placement (1-4)

Nine month agency-based 500 hour field placement. Supervised field placement to integrate advanced theory and skill building. Core component of MSW curriculum. Required three times in advanced year.

## SW 513 -Research Methods for Social Work Advanced Standing Students (3)

Required research methods course for students admitted to the MSW Advanced Standing program. It as sures students have a solid foundation in research knowledge and skills needed for the advanced year of the MSW Program.

## SW 514-Cultural and Spanish Language Immersion for Social Workers Costa Rica (3)

Course includes culture and language classes with visits to socialservice agencies in Costa Rica. Course will prepare students to offer social work services in multicultural, multilingual settings through the context of social work values andethics and with special attention to antioppressive and non-discriminatory practice with diverse populations.

## SW 515 - Skills for the Helping Process - Groups (3)

Help students to develop assessment and intervention skills across multiple levels. Assess types and stages of groups, roles, and group dynamics. Develop a group proposal. Learn how to begin, facilitate, and end a group with clients, org anizations, and communities.
Corequisite:SW 511.

## SW 516-Motivational Interviewing (3)

Teaches the central theoretical and empirical tenets of Motivational Interviewing (MI), as well as the clinical skills necessary to deliver the intervention to a wide range of clients in diverse settings. Students will learn and practice both the spirit and techniques of motivational interviewing.

## SW 520 - Social Welfare History and Policy (3)

Addresses the policy making of social welfare and explores values and ethical choices affecting the process. Examines historical and contemporary issues and their impact on the social work profession and social welfare. Highlights relations among social problems, social policies, and social practices as means for promoting social justice.

## SW 521 - Advanced Anti-Oppressive Practice (3)

This course builds student capacity for anti-oppressive practice in the micro and mezzo practice arenas, with an emphas is on the micro levels of intervention. The focus is on the positional privilege of social worker and the oppression experiences of serviceusers (clients) and communities.
Prerequisite:SW 539 or SW 589. Corequisite:NA.

## SW 522 - Trauma Informed Care (3)

Prepares students to apply Trauma Informed Care principles. Reviews trauma and toxic stress (neurobiology, adversechildhood experiences, and resiliency) and uses this knowledge to evaluate behavior, policies, and procedures. Examines how TIC complicates and compliments others approaches with a specific focus on
the intersection with equity, inclusion, and cultural responsivity. TIC is beneficial to a variety of disciplines in a variety of settings including judicial/corrections, veterans' services, housing, healthcare, education, and child-welfare.

## SW 523 -Health Care Policies andPrograms (3)

Advanced policy course analyzes the history of selected health care policies, programs, and disease categories within the context of social work practice in health care. Contemporary outcomes in current health and service delivery systems presented froma policy perspective. Develops skills for policy change.

## SW 524 - Community Organization (3)

Presents community organizing as a well-es tablis hed social work method for promoting social change and improving community life through community and institutional reform. Topics for class will include an overview of the his tory of community organizing, models of community change (locality development, social planning and social action), methods of social change (advocacy, mobilizing, organizing, coalition building, and partnership), examples of community-based org anization, leadership development, and measuring the benefit to communities. Discussion also includes understanding the role of power and culture that exists within neighborhoods and communities.
Prerequisite: SW 520 or SW 589 (Advanced standing only).

## SW 525 -Poverty: Policies and Programs (3)

Examines the nature and causes of poverty and inequality in the United States and the impact of economic globalization on social work's response to these critical social problems. Studies ways in which people in poverty cope and support each other in low-income urban neighborhoods; examines the ways in which work and welfare interact with each other and with informal social supports. Addresses policy is sues, including those involved in both service and income strategies to relieve or prevent poverty; develops skills foreffective practice with lowincome communities, families, and individuals.
Also offered as SW 625 and may be taken only once for credit. . Prerequisite: SW 520 or SW 589 (Advanced standing only).
SW 526 - Applied Ethics and Law inSocial Work Practice (3)
Apply ethical theory, law, policy, and codes to actual social work practice cases and situations. Consider the role of individual free will, and strategies to address the influence of personal values and biases. Explore the
interpretation and application of Oregon statutes to social work practice.

## SW 528 - Facilitation of Multi-disciplinary/Care Coordination Team Meetings (3)

Addresses the theoretical foundations, applications and facilitation skills required for collaborative participatory decis ion-making in the context of social work practice across populations. Develop framework for facilitating indepth strengths, needs assessment and problemsolving. Gain understanding and skills in balancing power dynamics, clinical perspectives, and timely decisionmaking within agency parameters.

## SW 529 - International Mental Health Policy (3)

Compares mental health policies froma global perspective, emphasizing United Nations and World Health Organization perspectives. Programs and policies from various countries are compared and contrasted with those of the U.S., and Oregon in particular.
Also offered as SW 629 and may be taken only once for credit. . Prerequisite: SW 520 or SW 589 (Advanced standing only).

## SW 530 -Social Work Practice with Individuals and Families I Theory and Engagement (3)

The first in a two-course sequence focusing on social work practice with individuals and families and integration of theory into practice. Students will develop engagement and exploration skills for working with individuals and families. They will critically evaluate and apply commonly used human development theories during the engagement and exploration phase of generalist practice. A framework for critical evaluation will be presented for comparing, applying, and evaluating various development theories covered in the course.

Corequisite: SW 511.

## SW 531 - SW Practice with Individuals and Families II Theory, Ass essment and Intervention (3)

The second in a two-course sequence focuses on social work practice with individuals and families and integration of theory into practice. Students will develop as sessment and intervention skills for working with individuals and families. They will critically evaluate and apply commonly used human development theories during the assessment and intervention phase of generalist practice. A framework for critical evaluation will be used to compare, apply, and evaluate various human development theories covered in the course.

Prerequisite: SW 530. Corequisite: SW 511.

## SW 532 -Advocacy and Empowerment (3)

Builds the advocacy skills to formpurposive and equitable partnerships with service users, their communities, and organizations. Includes empowerment-based practices in micro, mezzo and macro work. Healthy critique of the role of the professional social worker as "expert" is examined.

Prerequisite: SW 520.

## SW 533 - Advanced Clinical Practice I(3)

This first courseteaches social work practice that honors the strengths, vulnerabilities, goals, and needs of clients and how to be responsive to the socio-political and systemic contexts of clients' lives. Students learn engagement, as sessment, and case-conceptualization skills grounded in critical theory. Students are supported to connect with their own competence, compassion, and hope; and to develop self-awareness. Attention is paid to recognizing oppressive conditions and pathologizing narratives that impact clients, policies, and service delivery.

Prerequisite: SW 511 or SW 589 (Advanced standing only). Corequisite: SW 512.

## SW 534 - Advanced Clinical Practice II (3)

This second course focuses on increasing student selfawareness of the perspectives, strengths, biases and limitations they bring to clinical practice. Attention is given to exploring practice theories and specific intervention skills related to clinical work. Students are supported to learn about practice theory and cultural context models. Students will learn skills in managing reactivity (their own and that of client systems) and in the provision of different interventions through direct practice.

Prerequisite: SW 533. Corequisite: SW 512.

## SW 535 - Advanced Clinical Practice III (3)

This final course provides students an opportunity to articulate their personal theoretical orientation and preferred practice models. Student commitment to effectiveness and accountability is reinforced through review of evidencebased principles, professionalethics, and the ongoing integration of research and evaluation. The course includes content on using supervision/consultation, continuing education, licensure, and practices of self-care. Students will also critically examine the impact of white supremacy culture on agency practices, systemstructures, and clinical services.

Prerequisite: SW 534. Corequisite: SW 512.

## SW 539 -Social Justice in Social Work (3)

Examines epistemological and theoretical approaches to understanding social justice and equity as they relate to social exclusion, marginalization, and oppression.

Prerequisite: Must be enrolled in the MSW program.

## SW 541 -Societal, Community and Organizational Structures and Processes (3)

Service users and social work practitioners are constrained by societal, community, and organizational structures and processes. Social construction of conceptual frames with socialwork values andethics are critiqued. Theories addressing the behavior and change in process of communities and organizations are applied and evaluated.

## SW 542 -Social Work in Native American Communities (3)

Introduces and expands social work knowledge and methods appropriate for working with tribal and urban Indian communities. Thehis torical, social and cultural contexts of social work practice with individuals, families, groups, and communities in Indian Country will be examined.

## SW 543 - The African American Family: Multigenerational Trauma and Issues of Violence (3)

Exposes students to historical events and policies which have led to contemporary social problems and structural inequalities that continue to negatively impact African Americans. Will provide practical tools to inform practice at the five levels of service and empower individuals, families, groups, organizations and communities throughout the change process.

## SW 544 - Mid-Life and Beyond (3)

Focuses on development in mid and late adulthood froma lifes pan pers pective. Promotes appreciation of the developmental potential for normal and healthy aging. Explores demographic, socio-historical and developmental characteristics of currently emerging older adults. Focuses on current developmental theories in socialcognition and identity development in mid and late adulthood.

## SW 547 - Social Work andEnvironmental Justice (3)

Explores the role of racism, colonization, white supremacy, neoliberalism, and capitalis min environmental injustice through an Africana worldview. Employs a multidisciplinary perspective to examine the role of social work in achieving en vironmental justice at individual, community, regional, national, and global levels. This course considers theenvironmental, economic, and social aspects of sustainability, theoretically and practically, and social work links to the attainment of justice. Clas s includes a photovoice project focused on environmental justice.

Prerequisite: SW 541 or SW 589.

## SW 548 -Latinx Informed Mental Health Practice (3)

Provides a foundation of Latinxsocial work in outpatient mental health and integrated health settings. Examines Latinx cultural divers ity, health disparities, values, attitudes, traditions, spirituality and offers general guidelines to integrate these cultural factors in effective behavioral/mental health screens and evaluations as well as interventions to address consumers' needs.
Prerequisite: (SW 530 and SW 531) or SW 589.
SW 549 - Spirituality in Social Work Practice (3)
Explore the spiritual and religious diversity of clients and communities and its role in individual, group and community life. Identify and apply a framework of knowledge, values and practice methodologies to conducting bio-psychosocial spiritual as sessments within a wide range of social work practice settings.

## SW 550 - Introduction to Social Work Research (3)

Introduction to research and evaluation as systematic inquiry in social work. Introduces knowledge and skills for critical engagementand design of research relevant to social work practice and policy, promotes social and economic justice, advances human and social well-being, and works to end racismand discrimination. It covers quantitative, qualitative, and mixed-methods. Addresses cultural sensitivity and inclusion, diversity, andethical challenges, including protection of human subjects and application of research to promote social justice.

## SW 551 - Research and Evaluation II (3)

Focuses on techniques of quantitative data analysis and introduces methods of qualitative data analysis. Descriptive statistics, probability theory and hypothesis testing, and inferential methods. Addresses connections between (a) social work research and evaluation and (b) social and economic justice, cultural sensitivity, inclusion, and diversity.
Prerequisite: SW 550.

## SW 552 - Applied Program Evaluation for Social Work

 (3)Carefully designed and implemented evaluation can answer critical questions for social work practitioners such as: What group of intended beneficiaries does a program actually reach? Did the intervention accomplishits goals? How can interventions or programs be improved? In this course, students will learn the foundations of program evaluation design in social work practice. Working with a community partner, students will constructa comprehensive evaluation design that eng ages community
stakeholders and is responsive to the structural and sociocultural context.
Prerequisite:SW 550 or SW 589.

## SW 553 - Research for Racial Justice (3)

Reduce racial inequities in organizations requires gaining theory and practice skills. This course provides both, integrating heightened attention to policy, research and intervention approaches to reduce racial dis parities in a wide array of human service systems. The course focuses on building individual, org anizational and leadership efficacy for advancing racialequity.
Prerequisite: SW 550 or SW 589.

## SW 554 -Social Work Perspectives on Mental Health Dis orders: Children and Adolescents (3)

Reviews and analyzes mentaldis orders impacting Children and Adolescents fromDSM-5 and SW perspectives and variables that reshape and redefine concepts and definition of MH. The development, use, influence, and limitations of DSM are considered from various contexts. Examine strategic approaches to assessment, diagnosis, and intervention fromSW perspectives with developmental and age-appropriate applications focus. Incorporates best practices that support self-determination, social justice, diversity, and community integration, and emphasize youth and family narratives of MH symptoms.
Prerequisite: SW 531 or SW 589.

## SW 555 - Social Work Perspectives on Mental Health Disorders: Adults (3)

Reviews and analyzes mental dis orders fromDSM-5 perspectives and variables thatres hape and redefine concepts and definitions of mental health and illness. The development, use, influence, and limitations of DSM are considered from various contexts. Examines strategic approaches to assessment, diagnosis, and intervention from the recovery philosophy and SW perspectives.
Prerequisite: (SW 530 and SW 531) or SW 589.

## SW 556 - Clinical Practicein IntegratedHealth (3)

The objectiveof this course is to introduce students to the direct practice of social work in integrated medical settings. Students will gain knowledge of social work practice in medical settings, understanding the intersections of physical health, mental health, substance use and influencing sociopolitical factors. Through focused work on engagement, assessment and intervention students will learn how to work effectively on multidisciplinary teams and develop skills in brief and/or single session work.
Prerequisite: (SW 530 and SW 531) or SW 589.

## SW 557 -Supervision in Social Work Practice (3)

Explores the knowledge and skills foreffective social work supervis ion, emphasizing a collaborative, developmental, reflective and competency-based approach. Attention is paid to the cross cultural, sociopolitical, and ethical influences on supervis ion and the supervisory relationship.

## SW 558 - Abuse and Trauma: Theory and Intervention (3)

Examines the impact of trauma and abuse on adults, children, and families. Acute and long-termsequelae will be identified, emphasizing the interaction of traumatic and developmental effects. An integrative biopsychosocial intervention model for working with individuals, groups, and families will be explored through multiple theoretical lens.

Prerequisite: (SW 530 and SW 531) or SW 589.

## SW 559 - Community and Organization Research (3)

Prepares for mezzo and macro research practices to create the evidence base for socialchange (building the research base to advance reforms ), strengthening organizations (designing and using programevaluation to improve programs and organizations), and building the voice and influence of marginalized communities (including local and regional communities and organizational service users).
Prerequisite: SW 550 or SW 589.

## SW 560 - Understanding and Working with LGBT Populations in Social Work (3)

Explore current theory of privilege and oppression that applies to sexual orientation/gender/gender identity/gender expression. Emphas is on combating oppression and discrimination in professional, personal, community, and social environments, and in developing affirming SW practices. Focus on students engaging in experiential learning that challenges their internalized and socially constructed beliefs.

## SW 561 - Clinical Social Work with Groups (3)

Deals with the theory and practice of clinical social work within the wide range of groups in which social workers participate as workers and co-workers. Articulates issues related to group process and development as to theireffect on the group experience. Includes leadership strategies and diverse populations.
Prerequisite: SW 515 or SW 589.

## SW 562 - Loss \& Grief Across the Lifespan (3)

Examination of loss and grief in relation to death and diverse non-death experiences across the lifespan. Review of theory, research, and best practices for social workers helping with bereavement processes, grief integration, and meaning making for individuals, families, and across communities. Unique cultural and spiritual perspectives discounted or devalued through dominant discourses are brought to light.
Prerequisite: (SW 530 and SW 531) or SW 589.

## SW 563 -Social Work with Children, Adolescents, and Their Families (3)

Explores clinical social work practice with children, adoles cents, and families. Emphasizes a collaborative and contextual approach that, in addition to child-focused interventions, includes work with parents, families, and groups in a variety of settings. Delineation and demonstration of specific clinical strategies and techniques with opportunities to practice and apply in field.

Prerequisite: (SW 530 and SW 531) or SW 589.

## SW 564 -Social Work in Schools (3)

Uses a policy/practiceperspective to prepare students for effective and culturally sensitive social work practice in early childhood and K-12 education. Presents multiple roles of school social workers and educational policies that provide context for practice. Emphasizes collaboration among families, schools, and communities.

## SW 565 - Critical Disability Studies in Practice (3)

Emphasizes deepening understanding of lived experiences of individuals with dis ability in the context of larger societal and community structures. Students will examine participation, community, health, mental health, education, academia, pers onal as sistance services, violence, hate crime, and employment through critical dis abilities studies theory and first person narratives. Through lectures, readings, guest speakers, assignments and discussions, students will engage with each other to encourage application of new concepts in current and future academic, profes sional, and personallives.

## SW 566 - Child Welfare Seminar: Practice and Policy (1)

Offered to social work students who also work in the field of child welfare across the state of Oregon. The course offers a 9-month online seminar format to discuss key practice and policy issues in child welfare and explore innovative approaches nationally and around the world. Students will deepen their knowledge of applying social work skills to their work in child welfare at both micro and
macro levels of social work practice. This course is repeatable for up to 3 credits.

## SW 567 -Evidence Based Interventions for Community Mental Health Practice (3)

Reviews and critiques evidence-based interventions for community-based mental health populations. These interventions include supported employment, as sertive community treatment/case management, psychosocial rehabilitation, psychopharmacology, recovery and cons umer pers pectives, and integrated treatment for cooccurring substance use disorders. Theoretical frameworks include harmreduction, transtheoretical/readiness to change, and health promotion.

Prerequisite: SW 531, SW 532, or SW 589 (Advanced standingonly).

## SW 568 -Interdisciplinary Community Mental Health Seminar (1-3)

Seminar on interdisciplinary relationships among social work, psychiatry, and nursing; and on a variety of clinical, and policy topics. For students in community mental health placements and those working with individuals with severe and persistent mental illness. Jointly offered with OHSU's Department of Public Psychiatry. Enrollment is limited to six students per termand requires instructor approval. This course is repeatable up to 2 times forcredit.

## SW 569 -Social Work in End-of-Life and Palliative Care (3)

Covers a broad range of topics related to social work and end-of-life and palliative care. Addresses: cultural and spiritual dimensions at end-of-life, pain and symptom management, hospice, ethical considerations, practice and policy guidelines, teamwork, mental health at end-of-life, vulnerable populations and resources available to patients and families.

## SW 570 - Brief Behavioral Interventions \& Treatment

 (3)Prepares students to practice brief interventions with clients and families. They will develop skills in case conceptualization, as sessment, intervention, and treatment planning using advanced therapeutic techniques and methods including solution-focused, cognitive-behavioral, and mindfulness with special focus on crisis intervention. Students will also gain knowledge and skills in antioppressive, culturally res ponsive practice.
Prerequisite: (SW 530 and SW 531) or SW 589.
Corequisite: NA.

## SW 571 - Substance Use, Abuse and Addiction and Social Work Practice (3)

Provide students with a foundation in direct and indirect practice is sues with clients, families and communities challenged by substance abuse and addiction. Assist students in further developing and integrating their social work practice frameworks with deeper understanding and skill regarding the psychodynamic, biological and ecological nature of substance abuse disorders.

## SW 574 -Social Work with Older Adults (3)

Mental and physical frailties experienced by older adults are examined for their implications for adaptation and intervention. Mental disorders as they are uniquely characterized in late adulthood are reviewed, with special emphas is on age appropriate assessment. Ps y chosocial interventions for both community and institutionalized populations will include individual, family, group, and environmentalapproaches.

## SW 575 - Multicultural Social Justice Work in Action (3)

Examine current perspectives on multicultural SW practices for individuals, families and groups marginalized due to race, ethnicity, economic status, sexual identity, and immigration. Develop strategies to provide holistic, empowering and culturally-responsive services based on as sessment, en gagement and intervention and the liberation health SW model.
Prerequisite: (SW 539, SW 530, and SW 531) or SW 589.

## SW 578 - Social Work in the Juvenile and Criminal Justice Systems (3)

Analyzes current controversies concerning the origin and meaning of criminal and delinquent behavior; the socioeconomic and multicultural characteristics of contemporary life contributing to delinquency and crime; social work's role in the "people processing system"; the major current modalities and inquiry into their effectiveness; social policy issues confronting the juvenile justice system; and current policy and practice trends toward incarceration and away fromrehabilitation.

Also offered as SW 678 and may be taken only once for credit. . Prerequisite: (SW 520 and SW 531) or SW 589 (Advanced standing only).

## SW 579 - Engaging with the Mandated Client (3)

Course examines legal, ethical and effective practice with involuntary clients, often members of oppressed groups. Will also address res earch reg arding "involuntary practitioners," self-care, client advocacy, value conflicts, and reformefforts.

## SW 583 -Empowerment Approaches with TransitionAge Youth with Mental Health Needs (3)

Prepares students to work collaboratively with youth and young adults with mental health needs. Co-taught with a young adult and a parent with mental health services experience. Focuses on skills for partnering with youth to overcome barriers to success, increase self-determination and leadership skills, and strengthen family and peer support.

## SW 584 - Intimate Partner Violence (3)

Aims to (re)introduce theories, interventions, research, and complex issues associated with intimate partner violence (IPV). Students will be as ked to explore the intersections of micro and macro violence to better understand the influence of state and structural violence on the lives of individuals and communities, particularly those from racialized groups.

## SW 585 -Fund Development and Grant Writing (3)

Deepening understanding of funding role and development in nonprofit industry. Application of fundraising strategies and grant writing to create or recreateinnovative programs and marketing strategies. Develop program budgeting, accurate case statements and mes sages, draft grant applications and learn to create and sustain authentic long term fund development strategies.

## SW 589 - Advanced Standing Seminar (4)

Students who successfully complete this seminar will demons trate the competencies to enter the advanced year of the MSW program. This seminar will provide a connection between the BSW curriculumand adv anced MSW curriculum, and evaluate students' readiness for advanced practice. The course requires students to demons trate foundational social work skills, critical selfreflection, and academic readiness for graduate course work.
Prerequisite: Admission to advanced standing program.

## SW 590 - Advanced Topics in Applied Research Methods for Social Work (3)

Builds on foundation research methods and data analysis courses. Courses offered under this number present an evidence-based framework for social work practice and methods for analy zing quantitative data (e.g., multiple linear regres sion) and/or qualitative data (e.g., ethnography). Emphasizes application of methods to build knowledge in a specialized area relevant to a student's field of practice and/or to complete an evaluation of
program(s) or practice. Emphasizes interpretation of results to inform effective social work practice in community and agency-based settings. May be repeated for credit.
Prerequisite: SW 550 or SW 589 (Advanced standing only).

## SW 591 - Child \& Adolescent Behavior \& Development in the Social Environment: Advanced Theory \& Research (3)

Builds on micro and macro Human Behavior in the Social Environment and research methods. Presents ecologicaldevelopmental framework and culturally sensitive theories for understanding individual, family, peer, school, community, and societal influences on child and adolescent behavior and development. Presents prevention framework for using research-based knowledgeof behavior and development.
Prerequisite: SW 531 or SW 589.

## SW 593 - Advanced Macro Practice I (3)

This course anchors the three-quarter advanced macro practice concentration. By leveraging learning opportunities in the clas sroom, in students' field settings, as well as in the community, students will develop the skills and knowledge needed to articulate how personal values, beliefs, and thoughts impact community and org anizational practice; employ well-developed assessment practices in order to understand the needs, desires, and constraints of communities and organizations; build effective and accountable collaborations with diverse stakeholders to advance justice.
Prerequisite: SW 511 or SW 589. Corequisite: SW 512.

## SW 594 - Advanced Macro Practice II (3)

This is the second in the three-quarter advanced macro practice concentration. By leveraging learning opportunities in the clas sroom, in students' field settings, as well as in the community, students will develop the knowledge and skills needed to: engage with constituents in ways that increase their vis ibility, voice, and influence; construct well-developed plans for community; and organizational change; and evaluate the effectiveness of community and org anizational practice.
Prerequisite: SW 593. Corequisite: SW 512.

## SW 595 - Advanced Macro Practice III (3)

This is the third in the three-quarter advanced macro practice concentration. By leveraging learning opportunities in the clas sroom, in students' field settings, as well as in the community, students will develop the skills and knowledge needed to evaluate the alignment of goals to outcomes in community and organizational practice; effectively communicate results and recommendations to stakeholders; build capacity for individual, community, and organizational well-being.

Prerequisite:SW 594. Corequisite: SW 512.
SW 601 - Research (0-15)
(Credit to be arranged.)

## SW 602 - Independent Study (1-9)

(Credit to be arranged.)

## SW 603 -Dissertation (0-15)

(Credit to be arranged.)

## SW 605 - Reading and Conference (0-15)

(Credit to be arranged.)

## SW 607 -Seminar (0-15)

(Credit to be arranged.)

## SW 610 -SelectedTopics (0-15)

(Credit to be arranged.)

## SW 620 -Substantive Area Conceptualization (3)

Primary focus is development of a conceptual framework to guide scholarly work in student's selected area of inquiry. Students define domain of interest, review relevant literature, consider cultural, his torical, and political contexts, and note relevance for human services professions. Students explore multiple theoretical perspectives, evaluate their merits, synthesize into conceptual framework, and discuss implications for research and practice.

## SW 621 -Social Problem Analysis: Intervention Phase (3)

Intervention phase of the social problemsolving process applied to the student's selected social problem. Focus is on the development of a multi-level intervention plan based on review of empiricalliterature. Programtheory and theories of change will be explored. Analys is of policy-level interventions and related effectiveness literature. Construction of logic models. Integration of policy and practice will be emphasized.
Prerequisite: SW 620.

## SW 622 - Substantive Area Investigation (3)

This class allows students to put into practice what they have learned in their theory, research methods, and substantive area courses. Students will design a study in their substantive area, focusing on methodological rigor, ethical practice, community/stakeholder engagement, and potential impact.
Prerequisite: SW 620.

## SW 625 - Poverty: Policies and Programs (3)

Examines the nature and causes of poverty and inequality in the United States and the impact of economic globalization on social work's response to these critical social problems. Studies ways in which people in poverty cope and support each other in low-income urban neighborhoods; examines the ways in which work and welfare interact with each other and with informal social supports. Addresses policy is sues, including those in volved in both service and income strategies to relieve or prevent poverty; develops skills for effective practice with lowincome communities, families, and individuals.
Also offered as SW 525 and may be taken only once for credit. . Prerequisite: SW 520 or SW 589 (Advanced standing only).

## SW 626 - Teaching and Learning in Health Promotion \& Social Work (3)

Focus on pedagogical theory and practice in professional settings. Students develop skills to design, evaluate, and implement effective curriculumand instruction across settings: clas srooms, community contexts, and research projects. Topics include educational theory, course design, learning and teaching strategies, assessment, and scholarship of teaching and learning. This is the same course as PHE 626 and may be taken only once forcredit.
Prerequisite: Doctoral student status in Social Work. Cross-Listed as: PHE 626.

## SW 629 - International Mental Health Policy (3)

Compares mental health policies froma global perspective, emphasizing United Nations and World Health Organization perspectives. Programs and policies from various countries are compared and contrasted with those of the U.S., and Oregon in particular.

Also offered as SW 529 and may be taken only once for credit. . Prerequisite: SW 520 or SW 589 (Advanced standing only).

## SW 630 - Philos ophy of Science for Social Sciences (3)

The goal of this course is to introducestudents to philosophies of science and the implications for scientific practices and other means of generating knowledge. The course will advances tudents' activities to critically analyze
is sues related to the consumption and production of knowledge in the social and behavioral sciences generally.

## SW 631 - Introduction to Quantitative Research Methods inSocial Work (3)

Introduces students to basic quantitative methods for applied social work research and examines the assumptions underlying quantitative methods. Reviews core elements of research design and the selection of appropriate methods to address specific types of research questions with attention to questions of ethics and research across diverse populations. Includes a review of internal and external validity is sues in conducting experimental and quasiexperimental designs. Provides experience in applying quantitative methods by developing a proposal for social work research project.

## SW 632 - Quantitative Data Analysis in Social Work Research (4)

Provides preparation in the selection and use of statistical methods appropriate for social work research questions. Covers descriptive statistics, probability theory, statistical inference, and basic inferential methods. Preparation for multivariate statistical methods. Empirical social work studies critiqued and discussed. Includes application and analys is laboratory.
Prerequisite: SW 630,631.

## SW 633 - Qualitative Research I: Critical Research Frames and Beginning Practices (3)

This course is the first part of a required three-term sequence that introduces students to the theoretical foundations and methods for qualitative research in social work. The class is designed to support learners with techniques and tools to approach the inquiry process from a critical perspective, as contextualized in the profession of social work. The forms of research methods covered in this research sequence (and introduced in this first course) cover qualitative research at the micro, mezzo and macro levels, specifically: individual lived experiences, society and culture, and language and communication. In order to covereach of these levels of analysis, the course will address at least one research methodology in each of the three levels. These are hermeneutic phenomenology, life his tory research, critical ethnography, and critical discourse analysis.
Prerequisite: SW 630.

## SW 634 -Quantitative Data Analysis in Social Work Research II (4)

Introductory multivariate statistical procedures. Core topics: correlation and partial correlation, reliability and validity of measures and scale construction, and linear and
logistic regression. Covers considerations of level of meas urement and distributional as sumptions for each statistical procedure. Balances developing theoretical understanding and hands-on running of tests and interpretation of results.
Prerequisite: SW 632.

## SW 635 - Qualitative Research II: Collecting Data for Interpretive \& Constructivist Research (3)

The second course of a required three-termsequence. Data collection methods with a special emphasis on collecting stories and narratives to explore the individual, group, community, organizational, and national experience.
Prerequisite: SW 630 and SW 633.

## SW 637 - Qualitative Research Methods for Social Inquiry (4)

Introduction to qualitative research methods in the social sciences. The course reviews epistemologies informing qualitative research. The course also explores commonly used methods including field notes, interviews, focus groups, case studies, observational methods, and openended surveys. Introduction to various analysis and writing strategies will be explored. This is the same course as Psy 637 and may be taken only once for credit.
Cross-Listed as: Psy 637.

## SW 640 - Research Practicum and Seminar (3)

Participation in a research study under the supervision of appropriate faculty. Opportunity to master research skills which fit the student's learning needs. Time on site working on the project is 100 hours. Seminar taken concurrently with practicumenables students to explore together their research experiences in their respective research projects. Students will gain deepening knowledge through comparis on of experiences. Pass/no pass only.
Prerequisite: SW 637.

## SW 644 - Mid-Life and Beyond (3)

Focuses on development in mid and late adulthood froma lifes pan perspective. Promotes appreciation of the developmental potential for normal and healthy aging. Explores demographic, socio-historical and developmental characteristics of currently emerg ing older adults. Focuses on current developmental theories in socialcognition and identity development in mid and late adulthood.

## SW 650 - History of Social Work Profession/al (3)

History of the profession of social work through a social justice lens. The role of government, economics, historical figures, and culture in shaping social work profes sion. Critical theories will guide the exploration of social work's
mission, history, ethics, values and prominent is sues within the context of national and international trends.

## SW 651 - Integrative Writing Seminar (1)

Course addresses integration of social work theory, practice, policy, and research. Synthesis developed through writing of manuscript for submission to professional journal, a grant application, or other suitable product. Assistance with submis sion provided.
Prerequisite: completion of Part I of comprehensive examinations. May be repeated for additional credit.

## SW 653 - PhD Data Analysis Seminar (1)

Provides a structure to facilitate a working group of researchers who share ideas and support one another in the conduct of res earch. Group members may work together on research projects as well as use the group to consult about independent res earch projects. Expected themes include research design issues, measurement selection, rating and coding procedures, data analysis and presentation and reporting of research results. The primary focus of this group is on quantitative methods, with secondary attention to qualitative methods. Course may be repeated for credit.

Prerequisite: SW 634.

## SW 660 - Ph.D. Seminar - First Year (1)

Discusses current research studies undertaken in the field of social work. Based on published articles, working papers, and research project materials, the seminar features presentations by social work faculty, graduate students, and community partners. Considers practical as pects of applied research, including methodological issues, cultural competency, consumer involvement, and interdisciplinary collaboration. May be repeated for additional credit.

## SW 661 - Ph.D. Seminar - Second Year (1)

The Ph.D. Seminar-Second Year is a three-termsequence designed to provide a forumfor students to continue professional exploration, and learn how to navigate finding and securing employmentopportunities both within and outside academia. Students also spend this time learning how to progress successfully through major miles tones post-coursework, including comprehensive examination and dissertation.

Prerequisite: SW 660.

## SW 678 -Social Work in the Juvenile and Criminal

 Justice Systems (3)Analyzes currentcontroversies concerning the origin and meaning of criminal and delinquent behavior; the socioeconomic and multicultural characteristics of
contemporary life contributing to delinquency and crime; socialwork's role in the "people processing system"; the major current modalities and inquiry into their effectiveness; social policy issues confronting the juvenile justice system; and current policy and practice trends toward incarceration and away fromrehabilitation.

Also offered as SW 578 and may be taken only once for credit. . Prerequisite: (SW 520 and SW 531) or SW 589 (Advanced standing only).

## SW 690 - Teaching Practicum and Seminar (3)

Focuses on the practical teaching aspects in various social work settings, including instruction in the classroom, and the facilitation of trainings and works hops. Salient theoretical and practical is sues in adult learning are explored. Discusses curriculumplanning and issues around human divers ity and teaching. Supports student teaching experiences. This course requires to complete 65 hours of hands-on teaching-related experience.

Prerequisite: SW 626.

## SW 700 - Pos tbaccalaureate Professional Development (1-6)

(Credit to be arranged.)

## SySc - Systems Science

## SySc 330U-Models in Science (4)

This interdisciplinary course focuses on the role of models in scientific inquiry. Students explore how scientists froma variety of disciplines use different types of models, including physical (scale), mathematical (analytic and numeric), agent-based, animal, and network. The course has three stages of inquiry: Definition, Analysis, and Synthesis.

## SySc 332U-Introduction to Agent-BasedModeling (4)

At the cros sroads of biology, ecology, economics, philosophy, and artificial intelligence, this course introduces Agent-Based Modeling: a new computer-based approach that's grounded in the perspective that the complex macro-level patterns we observe in social systems are emergent fromdecentralized and self-organizing micro-level interaction among agents following simple and localized rules.

## SySc 334U-Modeling Social-Ecological Systems (4)

Understanding social and ecological cycles and the interaction between social and ecological systems is essential for making human actions more sustainable. This course uses ideas fromUNEP's Green Economy Initiative
and an easy-to-learn computer modeling approach called SystemDynamics to explore the interaction between and dynamics within social-ecological systems.

## SySc 336U-Networks and Society (4)

Introduces the new science of networks and its role in modeling the inherently complex problems of an interconnected, global society. Simulations explore the evolution of hierarchical, small-world and scale-free network structures and their dynamic behaviors. Implications for information democracy, cyber-terrorism, alternative economies (among other topics of student interest) are discussed.
Prerequisite: upper-division standing.

## SySc 338U- Decision Making in Complex Environments: A View Towards Collective Action and Social Change (4)

An interdisciplinary course that explores the heuristics through which individuals, groups and communities make their decisions in response to their environmental conditions. Such actions are sometimes optimal, sometimes sub-optimal and sometimes outright irrational and harmful and the course identifies the reasons for deviations fromrational behavior.

## SySc 340U-Big Data and the Modern World (4)

Overview of data science, big data, and its impact society including its promise, limitations, and ethical considerations.

## SySc 342U-Systems Thinking for Social Change (4)

Why are complexs ocial problems like poverty, homeles sness, and climate change so hard to solve? How can we identify effective leverage points for change? This interdis ciplinary course addresses social challenges using the methods of systems thinking. We'll dig into real-world examples and learn how to create interactive systems "maps" using causal-loop diagramming. Causal mapping enables a rich understanding of context, interrelationships, and perspectives. Students will gain practical tools they can use in their future work.

## SySc 346U-Exploring Complexity in Science and Technology (4)

Introduction to ComplexSystems, an interdisciplinary field that studies how collections of simple entities org anize themselves to produce complexbehavior, use information, and adapt and learn. Focus on common principles underlying complexity in science and technology, and
includes ideas fromphysics, biology, the social sciences, and computer science. This course is the same as CS 346U; course may be taken only once for credit.
Cross-Listed as: CS 346U.

## SySc 350U - Indigenous and Systems Perspectives on Sustainability (4)

Explores sustainability by drawing upon the field of Systems Science and the perspectives of traditional and contemporary indigenous peoples and scholars. Dialogueoriented format and small group exercis es promote a cooperative, student-driven learning environment. Course work calls upon students to apply their developing understanding of sustainability to their own lives.

SySc 399-Special Studies (4)
(Credit to be arranged.)

SySc 399U-Special Studies (4)
(Credit to be arranged.)

## SySc 401 - Research (1-8)

(Credits to be arranged.)

SySc 403-Honor Thesis (1-8)
(Credits to be arranged.)

## SySc 405 - Reading and Conference (1-8)

(Credits to be arranged.)

## SySc 406 -Special Projects (1-12)

(Credits to be arranged.)

SySc 407 -Seminar (1-8)
(Credits to be arranged.)

SySc 409-Practicum (1-8)
(Credits to be arranged.)

## SySc 410 -SelectedStudies (1-6)

(Credit to be arranged.)

## SySc 411 -Systems Theory (4)

Surveys fundamental systems concepts and central aspects of systems theory. Gives an overview of the systems paradigmand the systems field as a whole. Topics include introductions to networks, set-and information-theoretic multivariate relations, dynamic systems, regulation and control, modeling, decision analy sis, optimization, and game theory.
Also offered for graduate-level credit as SySc 511 and may be taken only once for credit. Prerequisite: Upper-division standing and either CS 346 U or any course labeled SYSC 3XXU or SYSC 4XXU.

## SySc 413 - Holistic Strategies for ProblemSolving (4)

This course focuses on the application of Systems ideas and practitioner skill development across disciplines. Readings and diversified class sessions explore topics including the meaning of "holistic," multiple levels of analys is, multiple perspectives, values, learning org anizations, frameworks/processes for problem-s olving, and use of tools like graphic representations and causalloop diagramming.
Also offered for graduate-level credit as SySc 513 and may be taken only once for credit. Prerequisite: upper-division standing and completion of one SySc cluster course or permis sion of instructor.

## SySc 414 -SystemDynamics (4)

Introduces concepts and methodology to analyze dynamic behavior of systems with complexfeedback loops. Emphasizes building computer models to enhance understanding, make predictions, and find ways to improve the performance of systems and processes. Models are defined via "rate" equations that are numerically integrated to simulate behavior.

Also offered for graduate-level credit as SySc 514 and may be taken only once for credit. Prerequisite: Upper-division standing and either CS346U or any course labeled SYSC3xxU or SYSC4xxU.

## SySc 416 - Systems Thinking for Business (4)

Learn highly applied systemthinking that delivers crucial insights into business or career situations where the usual methods are lacking. Specifically, to developqualitative skills: systemarchetypes, leverage points, strategic behavior and game theory, ecosystems and evolution, and networks; and to gain high-level working knowledge of systemmodeling and simulation.
Also offered for graduate-level credit as SySc 516 and may be taken only once forcredit. Prerequisite: upper-division standing.

## SySc 418 -SystemSustainability and Organizational Resilience (4)

Organizations are complexadaptive systems coupled with their environment, supply chains, strategic partners, and competitors. Survival depends on structural resilience market turbulence, and the environmental/political climate. Principles of emergent leadership and living systems are applied to various fields including strategic business management, environmental stewardship, health and public adminis tration, technology management.
Also offered for graduate-level credit as Sy Sc 518 and may be taken only once for credit. Prerequisite: Upper-division standing and either CS 346U or any course labeled SySc $3 x x U$ or SySc $4 x x$.

## SySc 421 -Systems Philosophy (4)

A study of ideas central to systems theory and philosophy. The course focuses on concepts rather than mathematics, and org anizes systems ideas around the theme of the fundamental "difficulties" (problems, imperfections, modes of failure) encountered by systems of widely differing types. Though these systems ideas often come fromthe natural sciences and engineering, they are significant also for the social sciences, the professional fields, and even the arts and humanities.

Also offered for graduate-level credit as SySc 521 and may be taken only once for credit. Prerequis ite: upper-division standing and/or admission to the Honors College or one SySc cluster course.

## SySc 423 -Systems Ideas and Sustainability: Limits, Structural Change, and Resilience (4)

This course offers a systems-theoretic perspective on sustainability. Us ing graph theory, non-linear dy namics, game/decision theory, thermodynamics, and theories of complexity and complex adaptive systems, the course explores systems insights into the challengeof environmental, economic, and social sustainability and systems principles to help us meet this challenge.

Also offered for graduate-level credit as SySc 523 and may be taken only once for credit. Prerequisite: upper-division standing and completion of one of the SySc 300-level clustercourses.

## SySc 431 - Data Mining with Information Theory (4)

DMIT is a hands-on project-based course in which students use information- and graph-theoretic methods to analyze their own data to discover complexand nonlinear interactions. These methods are implemented in OCCAM, software developed at PSU, the main analyticaltoolused in the course.

Also offered for graduate-level credit as SySc 531 and may be taken only once for credit. Prerequisite: upper-division
standing and completion of one of the SySccluster courses.

## SySc 435 - Modeling \& Simulation with R and Python

 (4)Computer modeling \& simulation using general purpose tools, R and Python. Covers statistical and simulationbased approaches for simulating dynamics, MonteCarlo methods for addressing uncertainty and risk, and interacting agents to incorporate heterogeneity and network effects.

Also offered for graduate-level credit as SySc 535 and may be taken only oncefor credit. . Prerequisite: Stat 241 or Stat 243 and Mth 252.

## SySc 440 - Introduction to Network Science (4)

Interdisciplinary introduction to network science, complex systems research, and social psychological concepts. In depth exposure to foundations of network science, including clas sical topics: randomgraphs, small world networks, etc. Discussion of social processes such as social contagion, opinion formation, etc. Introduction to advanced topics: community detection and (social) network interventions.

Also offered for graduate-level credit as SySc 540 and may be taken only once for credit. . Prerequisite: Stat 241 or Stat 243, and Mth 261.

## SySc 445 - Application of Data Science (4)

Introduction to data science as a profession and toolset, including its role in various types of projects, from exploration to discovery to prediction. Surveys current methods and technologies, emphasizing what's possible, feasible, and practical in terms of modeling and interactive visualization. Complements courses focused on specific methods and tools. Expected preparation: It will be helpful though not required to have exposure to data management or programming/scripting tools such as Matlab, Mathematica, R, Python, SPSS, or advanced Excel scripting or formulas.
Also offered for graduate-level credit as SySc 545 and may be taken only once for credit. Prerequisite: Stat 241 or Stat 243 and CS 161.

## SySc 452 - Game Theory (4)

Study of cooperation, competition, and conflict in social systems and associated is sues of rationality. Emphas is is on game-theoretic models, particularly of dilemmas of collective action, their possible solutions, and their applications to social, economic, and political phenomena. Also covered are socialchoice theory, and other systems theoretic approaches to cooperation, competition and conflict.
Also offered for graduate-level credit as SySc 552 and may be taken only onceforcredit.

## SySc 501 - Research (1-9)

(Credits to be arranged.)

## SySc 502 - Independent Study (1-12)

(Credit to be arranged.)

SySc 503-Thesis (1-9)
(Credits to be arranged.)

## SySc 504 - Cooperative Education/Internship (1-9)

(Credit to be arranged.)

## SySc 505 - Reading and Conference (1-6)

(Credits to be arranged.)

## SySc 506 -Special Projects (1-6)

(Credits to be arranged.)

SySc 507 -Seminar (1-6)
(Credits to be arranged.)

## SySc 508-Workshop(2-6)

(Credits to be arranged.)

## SySc 509 - Practicum (1-9)

(Credits to be arranged.)

## SySc 510 -SelectedStudies (1-6)

(Credits to be arranged.)

## SySc 511 -Systems Theory (4)

Surveys fundamental systems concepts and central aspects of systems theory. Gives an overview of the systems paradigmand the systems field as a whole. Topics include introductions to networks, set- and information-theoretic multivariate relations, dynamic systems, regulation and control, modeling, decision analysis, optimization, and game theory.
Also offered for undergraduate-level credit as SySc 411 and may be taken only once for credit. Prerequis ite:
graduate standing, calculus, probability, computer programming.

## SySc 513 - Holistic Strategies for ProblemSolving (4)

This course focuses on the application of Systems ideas and practitioner skill development across disciplines. Readings and diversified class sessions explore topics including the meaning of "holistic," multiple levels of analys is, multiple perspectives, values, learning org anizations, frameworks/processes for problem-solving, and use of tools like graphic representations and causalloop diagramming.

Also offered for undergraduate-levelcredit as SySc 413 and may be taken only once for credit. Prerequisite: upperdivision standing and completion of one SySc cluster course or permission of ins tructor.

## SySc 514 -SystemDynamics (4)

Introduces concepts and methodology to analyze dynamic behavior of systems with complexfeedback loops. Emphasizes building computer models to enhance understanding, make predictions, and find ways to improve the performance of systems and processes. Models are defined via "rate" equations that are numerically integrated to simulate behavior.

Also offered for undergraduate-levelcredit as SySc 414 and may be taken only once for credit. Prerequisite: Graduate standing.

## SySc 516 -Systems Thinking for Business (4)

Learn highly applied systemthinking that delivers crucial insights into business or career situations where the usual methods are lacking. Specifically, to developqualitative skills: systemarchetypes, leverage points, strategic behavior and game theory, ecosystems and evolution, and networks; and to gain high-level working knowledge of systemmodeling and simulation.
Also offered for undergraduate-levelcredit as SySc 416 and may be taken only once for credit. Prerequisite: upperdivision standing.
SySc 518 - SystemSustainability and Organizational Resilience (4)
Organizations are complex adaptive systems coupled with their environment, supply chains, strategic partners, and competitors. Survival depends on structural resilience market turbulence, and the en vironmental/political climate. Principles of emergent leadership and living systems are applied to various fields including strategic business management, environmental stewardship, health and public administration, technology management.
Also offered for undergraduate-levelcredit as SySc 418 and may be taken only once for credit.

## SySc 521 -Systems Philosophy (4)

A study of ideas central to sy stems theory and philosophy. The course focuses on concepts rather than mathematics, and organizes systems ideas around the theme of the fundamental "difficulties" (problems, imperfections, modes of failure) encountered by systems of widely differing types. Though theses ystems ideas often come from the natural sciences and engineering, they are significant also for the social sciences, the professional fields, and even the arts and humanities.

Also offered for undergraduate-level credit as SySc 421 and may be taken only once for credit. Prerequisite: upperdivision standing and/or admission to the Honors College or one SySc cluster course.

## SySc 523 -Systems Ideas and Sustainability: Limits, Structural Change, and Resilience (4)

This course offers a systems-theoretic perspective on sustainability. Using graph theory, non-linear dy namics, game/decision theory, thermodynamics, and theories of complexity and complex adaptive systems, the course explores systems insights into the challenge of environmental, economic, and social sustainability and systems principles to help us meet this challenge.

Also offered for undergraduate-level credit as SySc 423 and may be taken only once for credit. Prerequisite: upperdivision standing and completion of one of the SySc 300levelcluster courses.

## SySc 525 - Agent BasedSimulation (4)

Introduction to simulation methods that impart simple rules to collections of "agents" that interact within an environmentrepresented as a spatial grid. The properties of the agents and the environment vary dynamically, and often result in behavior patterns that are complex in ways that are not readily apparent froman examination of the rules that generated the behavior. Suchbehavior is often referred to as emergent, with examples including flocks of birds, traffic jams, ant colonies, crowd phenomena, etc. Of particular interest is the fact that such phenomenaoccur without centralized control. This approach is often used to study social systems, but may be used to study a variety of natural and non-natural systems.
Also offered as SySc 625 and may be taken only once for credit.

## SySc 527 - Discrete SystemSimulation (4)

The primary focus is on the application of dis crete system simulation to real world problems us ing the Arena simulation language. The mathematical basis for dis crete systemsimulation is probability theory and queuing theory. It is used extensively in the fields of operations research, civilengineering, and industrialengineering. Students apply the tools to projects within their fields of interest.

Also offered as SySc 627 and may be taken only once for credit. Prerequisite: graduate standing or consent of the instructor. .

## SySc 531 - Data Mining with Information Theory (4)

DMIT is a hands-on project-based course in which students use information- and graph-theoretic methods to analyze their own data to discover complex and nonlinear interactions. These methods are implemented in OCCAM, software developed at PSU, the main analytical tool used in the course.

Also offered for undergraduate-levelcredit as SySc 431 and may be taken only once for credit. Prerequisite: upperdivision standing and completion of one of the SySc cluster courses.

## SySc 535-Modeling \& Simulation with R and Python

 (4)Computer modeling \& simulation using general purpose tools, R and Python. Covers statistical and simulationbased approaches for simulating dynamics, Monte Carlo methods for addressing uncertainty and risk, and interacting agents to incorporate heterogeneity and network effects.

Also offered for undergraduate-levelcredit as SySc 435 and may be taken only once for credit. . Prerequisite: Recommended preparation: Bas ic probability \& statistics and exposure to calculus; exposure to writing scripts (e.g. Matlab, Mathematica, R, etc.).

## SySc 540 - Introduction to Network Science (4)

Interdisciplinary introduction to network science, complex systems research, and social psychological concepts. In depth exposure to foundations of network science, including clas sical topics: random graphs, s mall world networks, etc. Dis cussion of social processes such as social contagion, opinion formation, etc. Introduction to advanced topics: community detection and (social) network interventions.

Also offered for undergraduate-levelcredit as SySc 440 and may be taken only once for credit. . Prerequis ite: Recommended preparation: Bas ic linear algebra, probability, statistics, and scripting tools such as Matlab, Mathematica, orR.

## SySc 545 - Application of Data Science (4)

Introduction to data science as a profession and toolset, including its role in various types of projects, from exploration to discovery to prediction. Surveys current methods and technologies, emphasizing what's possible, feasible, and practical in terms of modeling and interactive visualization. Complements courses focused on specific methods and tools. Expected preparation: It will be helpful though not required to haveexposure to datamanagement or programming/scripting tools such as Matlab,

Mathematica, R, Python, SPSS, or advanced Excel scripting or formulas.

Also offered for undergraduate-level credit as SySc 445 and may be taken only once for credit. Prerequisite: Stat 241 or Stat 243 and CS 161.

## SySc 551 - Discrete Multivariate Modeling (4)

This course focuses on information theory as a tool for modeling and multivariate analy sis and as a general framework for the study of structure and organization. The course examines the useof set- and information-theoretic techniques for the analysis of constraints in qualitative, as well as quantitative, data. Alsocovered are software implementations, relations to log-linear methods, and applications in the natural and social sciences and the arts.

Also offered as SySc 651 and may be taken only once for credit.

## SySc 552 - Game Theory (4)

Study of cooperation, competition, and conflict in social systems and associated is sues of rationality. Emphasis is on game-theoretic models, particularly of dilemmas of collective action, their possible solutions, and their applications to social, economic, and political phenomena. Als o covered are social choice theory, and other systems theoretic approaches to cooperation, competition and conflict.
Also offered for undergraduate-level credit as SySc 452 and may be taken only once for credit.

## SySc 557 - Artificial Life (4)

Artificial life (ALife) encompasses mathematical and computational studies of phenomena such as replication, metabolism, morphogenesis, learning, adaptation, and evolution. Situated at the intersection of computer science and biology (also physics and chemistry) and focused on abstract, materiality-independent aspects of life, its purpose is two-fold: to understand biological phenomena and to develop computational technologies. ALife bears significantly also on the social sciences and philosophy. It is part of the research programinto "complexadaptive systems". Emphasizes (1) cellular automata (and other discrete dynamical models), (2) ecological and evolutionary simulations, and (3) genetic algorithm optimization and adaptation. Other topics include artificial chemistry (metabolismand origins of life) and philosophical is sues.

Also offered as SySc 657 and may be taken only once for credit. Prerequisite: graduate standing, calculus, probability, computer programming.

## SySc 575 - AI: Neural Networks I (4)

Introduces approach for developing computing devices whose design is based on models taken fromneurobiology and on notion of "learning." A variety of NN architectures
and as sociated computationalalgorithms for accomplishing the learning are studied. Experiments with various available architectures are performed via a simulation package. Students do a major project on the simulator or a special programming project.
Prerequisite: graduatestanding. .
SySc 601 - Research (0-15)
(Credit to be arranged.)

## SySc 603 -Dissertation (0-15)

(Credit to be arranged.)

## SySc 604 -Internship (1-9)

(Credit to be arranged.)

## SySc 605 - Reading and Conference (0-9)

(Credit to be arranged.)

## SySc 607 -Seminar (1-9)

(Credit to be arranged.)

## SySc 608 - Workshop (1-9)

(Credit to be arranged.)

## SySc 610 -SelectedStudies (1-9)

(Credit to be arranged.)

## SySc 625 - Agent BasedSimulation (4)

Introduction to simulation methods that impart simple rules to collections of "agents" that interact within an environmentrepresented as a spatial grid. The properties of the agents and the environment vary dynamically, and often result in behavior patterns that are complexin ways that are not readily apparent froman examination of the rules that generated the behavior. Suchbehavior is often referred to as emergent, with examples including flocks of birds, traffic jams, ant colonies, crowd phenomena, etc. Of particular interest is the fact that such phenomena occur without centralized control. This approach is often used to study social systems, but may be used to study a variety of natural and non-natural systems.
Also offered as SySc 525 and may be taken only once for credit.

## SySc 627 - Discrete SystemSimulation (4)

The primary focus is on the application of discrete system simulation to real world problems using the Arena simulation language. The mathematical basis for dis crete systemsimulation is probability theory and queuing theory. It is usedextensively in the fields of operations research, civilengineering, and industrial engineering. Students apply the tools to projects within their fields of interest.
Also offered as SySc 527 and may be taken only once for credit. Prerequis ite: graduate standing or consent of the instructor. .

## SySc 651 - Discrete Multivariate Modeling (4)

This course focuses on information theory as a tool for modeling and multivariate analy sis and as a general framework for the study of structure and organization. The course examines the useof set- and information-theoretic techniques for the analysis of constraints in qualitative, as well as quantitative, data. Also covered are software implementations, relations to log-linear methods, and applications in the natural and social sciences and the arts.
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Also offered as SySc 557 and may be taken only once for credit. Prerequis ite: graduate standing, calculus, probability, computer programming.

## SysE - Systems Engineering

SysE 504 - Cooperative Education/Internship (1-9)

## SysE 505 - Reading and Conference (1-8)

(Credit to be arranged.)

## SysE 506-Special Projects (1-9)

(Credit to be arranged.)

## SysE 510 -SelectedStudies (1-6)

(Credit to be arranged.)

## SysE 561 -Logistics Engineering (4)

Concentrates on logistics froma systems engineering perspective. Systems will include a mix of products and processes, materials, equipment, software, people, data, information, and services, within some formofhierarchy. The design for supportability/serviceability, the production and effective distribution for customeruse, and the sustaining maintenance will be addressed on a total system life-cycle basis, with particularemphasis in the early phases of the development of new systems and/or reengineering of existing systems.
Prerequisite: basic knowledge of systems engineering concepts and statistics.

## SysE 567 - Systems Engineering Management (4)

Management techniques applicable to Systems Engineering as part of its interface role to integrate project control (cost and scheduling) and technical specialties, including evaluating new technologies and integrating with legacy systems, technical performance measures, development-process tailoring, maturity as sessment models, conducting technical reviews. Expected preparation: SysE591.

## SysE 573 - Requirements Engineering (4)

Students gain knowledge to translate need s and priorities into systemrequirements that are the starting point for the engineering of complexhard ware/software systems.
Topics include: larger context in which requirements for a systemare developed; developing mission needs or market opportunities first versus as sessing available technology first; translating needs and priorities into an operational concept and then into specific functional and performance requirements; assessment of requirements, including such aspects as correctness, completeness, consistency, measurability, testability and clarity of documentation; relationship between interface definitions and requirements; risk management of requirement is sues, and stakeholders inputto increase the prospects for project success. Case studies will be used, many provided by students and involving software-intensive systems. Recommended prerequis ite: SysE591.

## SysE 575 - Reducing Risk in Decision Making (4)

Examines the concepts, techniques and tools for managing risk and making decisions as key components of the systems engineering process. Risk connotes a measure of the probability and severity of an undesiredevent. Begins with an overview of the risk management (identifying, assessing, monitoring, and mitigating) and decision process. Differences between mission critical and nonmis sion critical programmatic risk emphasized. Other topics include the limits of expected value-based risk analys is, decision making strategies such as max/min, $\mathrm{min} / \mathrm{max}$ and regrets. Formal methods in risk analysis, elementary decision analysis and decis ion trees, multiobjective decision making, pareto techniques, optimality, and trade-off analysis will be covered. Risk and decision techniques will be contrasted with theinterfacing processes of programmanagement and software engineering, from both the government and industrial perspectives.
Prerequisite: experience with systems engineering process.

## SysE590 - Integrative Workshop(0-4)

Systems engineering is an acquired behavior to be developed throughout the master's degree program. Students and faculty ad visers will eng age in creative workshop activities integrating technical specialty skills and project experienceinvoking systems engineering applications of communication, synthesis and creativity, teambuilding, problemsolving, management of time and resources, and systemlife-cycle thinking. A student portfolio will document the programplan and document that the desired behavioral change is taking place.
Prerequisite: consent of instructor. Pass/No pass only.

## SysE 591 - Systems Engineering Approach (4)

Engineering of complexhardware, software systems encompasses quantitative methods to understand vague problemstatements, determine what a proposed product/systemmust do (functionality), generate measurable requirements, decidehow to select the most appropriate solution design, integrate the hardware and software subsystems, and test the finished product to verify it satisfies the documented requirements. Additional topics that span theentire product life cycle include interface management and control, risk management, tailoring of process to meet organizational and project environments, configuration management, test strategies, and trade-off studies.
Prerequisite: consent of instructor.

## SysE 595-Hardware-Software Integration (4)

Systems engineering is applied to the integration of hardware-s oftware systems, focusing on embedded computer products development and information technology systems. Factors that affect the selection of hardware and software solutions in design will be
examined, as well as the use of tradestudies to optimize the efficiency of integration is sues. Techniques for partitioning of system-level functions and requirements to hardware/software components will be provided, as will practical guidance, through case studies, process templates, and design checklists.

Prerequisite: basic understanding of hardware and software development.

## TA - Theater Arts

## TA 101 - Theater Appreciation (4)

This course is intended as a general introduction to the art of the theater: acting; directing; playwriting; scenic, costume, and lighting design. Emphasis is placed on theater as a performing art today rather than upon the history or origins of the theater. The class, in part, involves attendance at live performances and events in the Portland area.

## TA 102 - Introduction to Acting (4)

A study in the basic building blocks of how to approach, prepare, and act a role. Text analys is, improvisation, exercises to expand the imaginative world of the play, preparation, commitment to an action, commitment to body and voiceexercises to increase awareness, and how to work collaboratively.

## TA 111 - Stagecraft I (3)

An introduction to backstage fundamentals and the tools and techniques used to build scenery. Also covered are technical drawings, stage machinery, and rigging.
Corequisite: TA 114.

## TA 112 - Stagecraft II (3)

This second course in a two-course sequence concerns stage lighting and sound. Students will learn to read lighting plots and to understand lighting instruments and controls. Sound equipmentand its installation for production will be covered. This course requires a twohour lab period per week and participation in departmental productions presented that term. This is the second course in a sequence of two: TA 111 and TA 112 and must be taken in sequence.

Prerequisite: TA 111. Corequisite: TA 115.
TA 114 - Technical Theater Production I (1)
Students gain hands-on proficiency in stagecraft while working on the department's current production.

Corequisite: Must be taken with TA 111.

## TA 115 - Technical Theater Production II (1)

Students gain hands-on proficiency in stagecraft while working on the department's current production.
Prerequisite:TA 111 and TA 114. Corequisite:TA 112.

## TA 121 - Introduction to Design for Theater (4)

Introduces the four primary fields of theatrical design scenery, costumes, lighting and sound, with an emphasis on analysis, res earch, and the exploration of design ideas. Basic artistic skills and techniques introduced to aid development of the skills required to communicate design. Technical skills are not required.

## TA 134 - Workshop Theater: Scenery, Costume \& Lighting Production I (1)

A study and practical application of skills related to scenery, costume, and lighting for the theater. Students will learn through participating on construction and implementation and/or run crews for the departmental production.

## TA 144 - Voice for the Actor I (3)

An introductory course in basic principles and techniques of voice production specifically forstage performance including physiology, breath support and res onance, articulation and projection.

## TA 145 - Acting Workshop(1-4)

Rehearsal, performance, and analysis of scenes directed by Directing I students for studio presentation and critique.
Prerequisite: TA 102.

## TA 146 - Acting/Playwriting Workshop (3)

Readings, discussions, and walk-throughs of plays written by Playwriting II students.
Prerequisite: TA 142.

## TA 147 - Movement for the Actor (3)

Introduction to concepts and techniques of theatrical movement and physical theater. Will utilize a variety of relaxation, centering, stylization, and imagery exercises designed to increase body awareness and expressiveness. Skills in ensemble, mime, mask, and light acrobatics will be developed.

## TA 151 - Introduction to Theater Arts \& Practice (4)

Investigates theater as both a dramatic art and an industry. Introduces topics in theater history, playwriting,
performance, design, and theater management. Students exposed to a variety of productions and theater professions in the Portland community.

## TA 199 - Special Studies (1-12)

(Credit to be arranged.)

## TA 201 - Script Analysis (4)

Examination and analysis of fundamental principles of dramatic structure, form, and style though study and analys is of representative plays selected frommajor periods. Emphasis on the productionimplications of selected text.

## TA 234 - Workshop Theater: Scenery, Costume \& Lighting Production II (1)

A study and practical application of skills related to scenery, costume, and lighting for the theatre. Students will learn through participating on construction and implementation and/or run crews for the departmental production. 200 level workshops assume familiarity with the shop(s); a higher level of res ponsibility will be expected.

Prerequisite:TA 134.

## TA 241 - Improvisational Acting I (3)

Seeks to acquaint the student through exercises, theater games, and study of basic techniques for creative role playing with the skills and techniques necessary for improvisational acting and de velopment of material for public performance. This is the first course in a sequence of two: TA 241 and TA 242 which must be taken in sequence.

## TA 242 - Improvisational Acting II (3)

Seeks to acquaint the student through exercises, theater games, and study of basic techniques for creative role playing with the skills and techniques necessary for improvisational acting and development of material for public performance. This is the second course in a sequence of two: TA 241 and TA 242 which must be taken in sequence.

## TA 248 - Acting I: Process (4)

The first acting class for the major. Emphas is on the building blocks of actor technique leading into scene work: text analys is for the actor, preparation, commitment, character arc, boldness, rhythm, living a life onstage, and
collaboration. This course is rigorous and demands outside time commitment for rehears al.

Prerequisite:TA major; sophomore standing.

## TA 252 - Stage Makeup (2)

A study of the basic principles of the art and technique of makeup fors tage and screen.

## TA 253 - Workshop Theater I- (1-3)

Training in theater production through the intensive study and rehearsal of scenes and plays. Maximum: 12 credits.

## TA 299 - Special Studies (1-4)

(Credit to be arranged.)

## TA 305U - Understanding Theater (4)

An investigation of theater designed to develop a heightened awareness of how the theater arts express and communicate ideas and experiences. To expand critical awareness of the process by which theater creates meaning and communicates through performance to contemporary audiences. Course will examine the dynamic relationship between theater and the society it both mirrors and influences.

## TA 311 - Scene Design I (4)

A study of visual arts principles as related to scenic design. Projects in stage geography, design composition, and visual imagery are used to develop thestudent's communication skills in the area of scenic design.
Prerequisite:TA 111, 112, 301, 316. Recommended:TA 114 and 115.

## TA 312 - Scene Painting (3)

Training to extend the student's basic skills in traditional methods and techniques of scene painting.

Prerequisite: TA 111, 112. Recommended:TA 114, 115, and 316.

## TA 314 - Lighting Design 1 (4)

Introduction to stage lighting. Exploration of the medium of light through observation, analysis, and recreation while working with the fixtures used in modern stage lighting. Also includes the graphic standards for stage lighting design. Open to non-majors with instructor consent.

Prerequisite: TA 121, TA 201.

## TA 316 - Technical Theater Lab (2)

Students gain advanced hands-on proficiency in stagecraft while working on the department's current production. Students will take on greater res ponsibilities on productions building on their experiences from the TA 114/TA 115 production labs.
Prerequisite: TA 111, TA 112, TA 114, TA 115.
TA 317 - Theater Technologies (2)
The study and practical application of advanced techniques and materials in all as pects of stagecraft, including drafting and drawing for the sceneshop, theorganization and planning of scenery construction within a production calendar, and problem solving on current department productions. Expected preparation: TA 114, 115.

Prerequisite: TA 111, TA 316.

## TA 321 - Introduction to Costume Design (4)

An introduction to the theory, techniques, and design principles of contemporary stage costumes.
Prerequisite: TA 111, TA 201.

## TA 322U- History of Dress I (4)

Historical survey of dress in Western civilization from ancient Egyptian to modern times with emphasis on aes thetic, cultural, and political expres sions of clothing. Course may be taken out of sequence.
Prerequisite: Upper-division standing. Cross-Listed as: This is the same course as Art 322U and may be taken only once forcredit.

## TA 323U- History of Dress II (4)

His torical survey of dress in Western civilization from ancient Egyptian to modern times with emphasis on aes thetic, cultural, and political expres sions of clothing. Course may be taken out of sequence.
Prerequisite: Upper-division standing. Cross-Listed as: This is the same course as Art 323 U and may be taken only once forcredit.

## TA 325 - Costume Production (2)

A study and practical application of stage costume construction techniques, beginning and advanced. Students will participate in the construction of costumes for departmental productions. Recommended prerequisite: 3 credits of theater arts. Maximum 6 credits.

## TA 326 - Pattern Development (1-4)

A study and practical application of the methods for creating patterns for theatrical costumes, including flat drafting, draping, and period pattern adaptation.

Prerequisite:TA 325. Recommended:TA 321.

## TA 327 - Costume Technology (1-4)

A study and practical application of costume craft and decorative techniques, including fabric dyeing and painting and accessories fabrication. Recommended prerequisite: TA 321.

## TA 330U- Multicultural Theater (4)

Exploration of the diversity of our society through theater --comparing and contrasting the works of certain ethnic specific writers and those writers often considered to be in the mainstreamof the modern theater.

## TA 333 - Workshop Theater: Directing/Stage Management/Dramaturgy (1-2)

For the School of Music and Theater productions. Offerings include stage manager, assis tant director, dramaturg, choreography, and music direction. Participants are required to audition or interview for productions. Information about auditions/interviews is provided on the Theater Call Board outs ide of LH 127. Meeting times are arranged by the director. Most performances and rehearsals are held in the evening. Technical rehearsal for mainstage productions require a full weekend technical schedule. Course is repeatable forcredit.

## TA 334 - Workshop Theater: Scenery, Costume \& Lighting Production 3 (1-2)

ForPSU Theater Department productions. Offerings include scene construction and painting, costume construction and crew, stage/run crews, props, sound design and crew, lighting design and crew. Meeting times depend upon the assignment registered for, butusually include daytime, evening, and/or weekends. Technical rehears al for mains tage productions require a full weekend technical schedule. Course is repeatable for credit.

## TA 335 - Workshop Theater: Management/Publicity (1)

ForPSU Theater Department productions. Offerings include house management, public relations, audience development, publications, educational outreach, and display. This course meets each termfor one hour per week as a group, with the remaining meeting times depending upon the specific assignments for the termin question. Meeting times depend upon the as signment registered for, but may include daytime, evening, and/or weekends. Course is repeatable for credit.

## TA 340 - Acting II: Scene Study (4)

Building on TA 248, coursework deepens the student actor's understanding of arc, character development, commitment, rhythmof sound and language, and choices that ignite the text. Class demands commitment to intense scene work outside the classroom. Must be taken in sequence.

Prerequisite: TA major, TA 248, and permis sion of instructor.

## TA 341 - Acting III: Classical Text (4)

Building on TA 340, and using increasingly difficult texts, this advanced class moves the actor further into technique. Language and epic style is a major focus of the work, with emphasis on such writers as Shakespeare, Moliere, Behn, and Ford. Class demands commitment to intense scene work outs ide the classroom.

Prerequisite: TA major; TA 248 and TA 340, and permis sion of instructor.

## TA 342 - Advanced Acting (4)

Builds on past lessons and explores the way we rehearse and apply our craft. Individual acting blocks are addressed. Advanced acting problems are explored through complex texts. Must be taken in sequence.

Prerequisite:TA major; TA 341, and permission of instructor.

## TA 344 - Voice for the Actor II (3)

An intermediate course in the principles of voice production for the stage, concepts and techniques for adapting the voice to various stage environments, and techniques necessary for analyzing stage speech problems and developing appropriate solutions.

Prerequisite: TA 144.

## TA 345 - Topics in Acting (1-4)

Intensive study of a particular subset of performance, for example, How 2 B Funny, Audition Techniques, Movement Performance or Stage Combat. This course is repeatable up to 6 times for credit.

## TA 346 - Stage Dialects (4)

An introduction to the method and techniques of dialect production for theatrical performance, including a survey of basic American, English, and European dialects.

## TA 347 - Mainstage Production (1-4)

Through rehearsal and the stage production, students are challenged to pursue a commitment to individual excellence and collaboration, dis cover a passion for their
discipline, and develop a firm grounding in the core components of live performance.

## TA 348 - Acting for the Camera (4)

An introduction to acting before the camera for film and video.

## TA 361 - Theater Appreciation (4)

An intermediate course in the art of the theater: acting; directing; playwriting; and, design. Specialemphasis on theater as a performing art today, not the history or origins of the theater. Course involves in part, attendance at live performances in the Portland area.
Prerequisite: upper-division standing.

## TA 363 - Development of Dramatic Art I (4)

Survey of dramatic literature and theater history from ancient times to the emergence of the modern theater in the 19th century. This is the first course in a sequence of two: TA 363, TA 364; the course is chronological in its presentation buteach termmay be taken separately.
Prerequisite: upper-division standing.

## TA 364 - Development of Dramatic Art II (4)

Survey of dramatic literature and theater his tory from ancient times to the emergence of the modern theater in the 19th century. This is the second course in a sequence of two: TA 363, TA 364; the course is chronological in its presentation buteach termmay be taken separately.

Prerequisite: upper-division standing.

## TA 369U- Women, Theater, and Society (4)

An examination of ways in which women and sexuality have been represented in Western theatrical production since the Greeks. Selected topics will be analyzed relating feminist theories to the creation of the theater arts by women, with consideration of cultural contexts in which they work. Study of artistic practice by women in relation to is sues of power, representation, and access.

## TA 381L-Lab for TA 381 (0)

Lab for TA 381.
Corequisite: TA 381.
TA 383L - Lab for TA 383 (0)
Lab for TA 383.
Corequisite: TA 383.

## TA 399 - Special Studies (1-6)

(Credit to be arranged.)

## TA 401 - Research (1-6)

(Credit to be arranged.)

TA 402 - Independent Study (1-12)
(Credit to be arranged.)

## TA 404 - Cooperative Education/Internship (1-12)

(Credit to be arranged.)

## TA 405 - Reading and Conference (1-6)

(Credit to be arranged.)

## TA 406 - Special Projects (1-6)

(Credit to be arranged.)

## TA 407 - Seminar (1-6)

(Credit to be arranged.) Recent topics have included Introduction to Playwriting and Women, Theater, and Society.

## TA 408 - Workshop(1-6)

(Credit to be arranged.)

## TA 409 - Practicum (1-12)

(Credit to be arranged.)

## TA 410 - Selected Topics (1-6)

(Credit to be arranged.)

## TA 421 - Costume Design (3)

An in-depth study of costume design principles. Emphasis is placed on the design of costumes for specific plays, using a variety of styles and rendering media.
Recommended:TA 325.
Prerequisite:TA 321.

## TA 430 - Scene Design 2 (4)

Advanced course in scene design for the theater. Emph as is on research, conceptual thought, the imagination and manipulation of the stage environment, constructive collaboration, and the development of technical skills required of professional scenic designers. Open to nonmajors with instructor consent.

Prerequisite: TA 311.

## TA 435 - Lighting Design 2 (4)

Advanced stage lighting with primary focus on implementation and documentation required to organize, communicate and track your ideas. Extens ive training in two ess ential programs: Vectorworks ${ }^{\text {TM }}$ and Lightwright ${ }^{\mathrm{TM}}$.

Prerequisite:TA 314. Open to non-majors with instructor consent.

## TA 440 - Advanced Acting Studio (1-4)

Advanced studio work focusing on rehearsal technique, style, preparation, developing material, and working with diverse environments, all leading to a public performance. May be repeated for a total of 12 credit hours.
Also offered for graduate-levelcredit as TA 540.
Prerequisite: TA major; TA 342, by audition/interview and permission of instructor.

## TA 454 - Directing I(4)

Study and practice in play analy sis and directing of scenes. Expected preparation: TA 311, TA 321.

Als o offered for graduate-level credit as TA 554 and may be taken only once for credit. Prerequisite: TA 111, TA 201, TA 248.

## TA 455 - Directing II (4)

Advanced practice in analysis and directing of plays for public performance.
Also offered for graduate-levelcredit as TA 555 and may be taken only once for credit. Prerequisite: TA 111, TA 316, TA 454.

## TA 460 - Advanced Directing (3)

Specific problems in directorial methods and styles for presentation in public performance.

Also offered for graduate-level credit as TA 560 and may be taken only once for credit. Prerequisite: TA 455 or equivalentexperience.

TA 466W -Development of Dramatic Literature (3)
A survey of dramatic literature fromits beginnings to the emergence of the modern theater in the late 19th century together with pertinent facts on theaters and stagings. The
course is chronological in its presentation buteach term may be taken separately.

## TA 467 - Modern Theater I (4)

A consideration of theater and drama fromthe late 19th and early 20th century to the present. Representative plays chosen from continentalEuropean, English, Irish, and American repertories. Examination of key directors and trends in staging. This is the first course in a sequence of two: TA 467 and TA 468. Courses may be taken out of sequence.

Also offered for graduate-level credit as TA 567 and may be taken only once forcredit. Prerequisite: upper-division standing.

## TA 468 - Modern Theater II (4)

A consideration of theater and drama fromthe late 19th and early 20th century to the present. Representative plays chosen from continentalEuropean, English, Irish, and American repertories. Examination of key directors and trends in staging. This is the second course in a sequence of two: TA 467 and TA 468 . Courses may be taken out of sequence.

Also offered for graduate-level credit as TA 568 and may be taken only once for credit. Prerequisite: upper-division standing.

## TA 471 - Theater History: Periods and Topics (1-4)

Concentrated study of a particular period and/or topic in theater history: for example, Ancient Greek Theater and Drama, Medieval and Renaissance Theater, Theater and Science, Restoration/18th Century Drama, American Theater and Drama, and Theatrical Expressionism. Expected preparation:TA 363 and TA 364 or appropriate sophomore inquiry course.
Also offered for graduate-level credit as TA 571.
TA 472 - Theater History: Major Figures (1-4)
Concentrated study of the contribution of one or more major theater artists: for example, Ibsen, Stanislavsky, Appia, Brecht, and Artaud.
Also offered for graduate-level credit as TA 572.
Prerequisite: upper-division standing.

## TA 474 - Dramatic Writing I (4)

A sequence in scriptwriting involving analy sis of dramatic structure, practical application of scriptwriting techniques. This is the first course in a sequence of two:TA 474 and TA 475 which must be taken in sequence.
Also offered for graduate-level credit as TA 574 and may be taken only once forcredit. Prerequisite: TA 201 or permission of the instructor.

## TA 475 - Dramatic Writing II (4)

A sequence in scriptwriting involving analysis of dramatic structure, practical application of scriptwriting techniques. This is the second course in a sequence of two: TA 474 and TA 475 which must be taken in sequence. Expected preparation: 8 credits of TA and/or English.

Also offered for graduate-level credit as TA 575 and may be taken only once for credit.

## TA 501 - Research (1-9)

(Credit to be arranged.)

TA 502 - Independent Study (1-12)
(Credit to be arranged.)

TA 503 - Thesis (1-9)
(Credit to be arranged.)

## TA 504 - Cooperative Education/Internship (1-9)

(Credit to be arranged.)

## TA 505 - Reading and Conference (1-6)

(Credit to be arranged.)

## TA 506 - Special Projects (1-6)

(Credit to be arranged.)

## TA 507 - Seminar (1-6)

(Credit to be arranged.) Recent topics have included Introduction to Play writing and W omen, Theater, and Society.

## TA 508 - Workshop(1-6)

(Credit to be arranged.)

## TA 509 - Practicum (1-9)

(Credit to be arranged.)

## TA 510 - Selected Topics (1-6)

(Credit to be arranged.)

## TA 511 - Introduction to Theater Research (2)

An introductory course in research methods and bibliography for graduate study in theater.

## TA 514 - History of Decor (4)

A historicalsurvey of period decor focusing on furniture and interior architectural detail from Egyptian to modern times with emphas is on periods mostcommonly used in theater production. Expected preparation: 6 credits of theater arts.

## TA 540 - Advanced Acting Studio (1-4)

Advanced studio work focusing on rehearsal technique, style, preparation, developing material, and working with diverse environments, all leading to a public performance. May be repeated for a total of 12 credit hours.
Also offered for undergraduate-levelcredit as TA 440 and may be taken only once for credit. Prerequisite:TA major; TA 342, by audition/interview and permis sion of instructor.

## TA 554 - Directing I(4)

Study and practice in play analy sis and directing of scenes.
Also offered for undergraduate-levelcredit as TA 454 and may be taken only once forcredit.
TA 555 - Directing II (4)
Advanced practice in analysis and directing of plays for public performance.
Also offered for undergraduate-levelcredit as TA 455 and may be taken only once for credit.

## TA 560 - Advanced Directing (3)

Specific problems in directorial methods and styles for presentation in public performance.
Also offered for undergraduate-level credit as TA 460 and may be taken only once for credit. Prerequisite:TA 455 or equivalentexperience.

## TA 567 - Modern Theater I (4)

A consideration of theater and drama from the late 19th and early 20th century to the present. Representative plays chosen from continental European, English, Irish, and American repertories. Examination of key directors and trends in staging. This is the first course in a sequence of two:TA 567 and TA 568. Courses may be taken out of sequence.
Also offered for undergraduate-level credit as TA 467 and may be taken only once for credit. Prerequisite: upperdivision standing.

## TA 568 - Modern Theater II (4)

A consideration of theater and drama from the late 19th and early 20th century to the present. Representative plays chosen from continental European, English, Irish, and American repertories. Examination of key directors and trends in staging. This is the second course in a sequence of two:TA 567 and TA 568. Courses may be taken out of sequence.
Also offered for undergraduate-level credit as TA 468 and may be taken only once for credit. Prerequisite: upperdivision standing.

## TA 571 - Theater History: Periods and Topics (1-4)

Concentrated study of a particular period and/or topic in theater history: for example, Ancient Greek Theater and Drama, Medieval and Renaissance Theater, Theater and Science, Restoration/18th Century Drama, American Theater and Drama, and Theatrical Expressionism. Expected preparation:TA 464 and TA 465 or appropriate sophomore inquiry course.

Also offered for undergraduate-level credit as TA 471.
TA 572 - Theater History: Major Figures (1-4)
Concentrated study of the contribution of one or more major theater artists: for example, Ibsen,Stanislavsky, Appia, Brecht, and Artaud.
Also offered for undergraduate-level credit as TA 472. Prerequisite: upper-division standing.

## TA 574 - Dramatic Writing I (4)

A sequence in scriptwriting involving analy sis of dramatic structure, practical application of scriptwriting techniques. This is the first course in a sequence of two:TA 574 and TA 575 which must be taken in sequence. Expected preparation: 8 credits of TA and/or English.
Also offered for undergraduate-level credit as TA 474 and may be taken only once for credit.

## TA 575 - Dramatic Writing II (4)

A sequence in scriptwriting involving analysis of dramatic structure, practical application of scriptwriting techniques. This is the second course in a sequence of two:TA 574 and TA 575 which must be taken in sequence. Expected preparation: 8 credits of TA and/or English.
Also offered for undergraduate-level credit as TA 475 and may be taken only once for credit.

## Tur - Turkish

These courses are currently inactive and the department is not planning offer themth is year.

## Tur 101 - First-Year Turkish Term1 (4)

Introduction to Turkish. Emphasis on elements of grammar, vocabulary building, and conversation. Elementary reading. This is the first course in a sequence of three: Tur 101, Tur 102, and Tur 103.

## Tur 102 - First-Year Turkish Term 2 (4)

Introduction to Turkish. Emphasis on elements of grammar, vocabulary building, and conversation. Elementary reading. This is the second course in a sequence of three: Tur 101, Tur 102, and Tur 103.

## Tur 103 - First-Year Turkish Term3 (4)

Introduction to Turkish. Emphasis on elements of grammar, vocabulary building, and conversation. Elementary reading. This is the third course in a sequence of three: Tur 101, Tur 102, and Tur 103.

## Tur 199 - Special Studies (1-5)

(Credit to be arranged.)

## Tur 201 -Second-Year Turkish Term1 (4)

Intensereview of materials introduced in first-year course and further development of communicative skill and reading comprehension. Elementary writing. This is the first course in a sequence of three: Tur 201, Tur 202, and Tur 203. Expected preparation: Tur 103.

## Tur 202 -Second-Year Turkish Term 2 (4)

Intensereview of materials introduced in first-year course and further development of communicative skill and reading comprehension. Elementary writing. This is the second course in a sequence of three: Tur 201, Tur 202, and Tur 203. Expected preparation: Tur 103.

## Tur 203 -Second-Year Turkish Term 3 (4)

Intensereview of materials introduced in first-year course and further development of communicative skill and reading comprehension. Elementary writing. This is the third course in a sequence of three: Tur 201, Tur 202, and Tur 203. Expected preparation: Tur 103.

## Tur 299 - Special Studies (1-12)

(Credit to be arranged.)

## Tur 301 - Third-year Turkish (4)

Composition, conversation, readings in literature, and grammar review. This is the first course in a sequence of three: Tur 301, Tur 302, and Tur 303. Expected preparation: Tur 203.

## Tur 302 -Third-year Turkish (4)

Composition, conversation, readings in literature, and grammar review. This is the second course in a sequence of three: Tur 301, Tur 302, and Tur 303. Expected preparation: Tur203.

## Tur 303 -Third-year Turkish (4)

Composition, conversation, readings in literature, and grammar review. This is the third course in a sequence of three: Tur 301, Tur 302, and Tur 303. Expected preparation: Tur 203.

## Tur 330U - Popular Culture and Literature in Turkey (4)

Development of popular culture and literature in modern Turkey. Impact of Westernization, modernization, journalism, and urban and European migration. Popular literature, films, and media interacting with Marxism, feminism, and Islamism. Conducted in English.

## Tur 331U- Women and Gender in Turkey (4)

Explores construction of gender, women's roles and is sues through modern Turkish literature and culture. Conducted in English.

## Tur 341U- Turkish Literature in Translation (4)

Study of texts representative of major Turkish authors, themes or genres from the modern period in translation. Examples are modern drama, realism, autobiography, contemporary novel. Conducted in English.

## Tur 361 U- Turkey through Film (4)

Viewing of feature films or made-for-TV series followed by discussion of social, historical, and artistic significance of the visual narratives. Individual directors like Yilmaz Güney, genres like comedy and period-dramas of the 1970s or 1960s may be used. Films have subtitles. Readings, viewings and discussions are in English. Expected preparation: Tur 203.

## Tur 399-Special Studies (1-12)

(Credit to be arranged.)

## Tur 401 - Research (1-6)

(Credit to be arranged.)

Tur 404-Cooperative Education/Internship (1-12)
(Credit to be arranged.)

## Tur 410 -SelectedTopics (1-12)

(Credit to be arranged.)

## Tur 416 - Readings in Turkish (2)

A variable-content course designed to give advanced students of Turkish experience reading in a variety of content areas. To be taken in conjunction with regularly scheduled co-requis ite courses. Students taking a corequisite course will do part of the required reading for that course in Turkish. Expected preparation: Tur 341.

## ULib - Library Research

Ulib 101 - Library Research Skills (2)
Introduces library research skills with a focus on information use in the digital environment. Topics include finding, evaluating, and using information ethically. Emphasizes research skills needed for undergraduate research assignments.

## ULib 510 -Special Topics (1-9)

(Credit to be arranged.)

## Ulib 511 - Library Research \& Scholarly Communication Fundamentals (1)

Introduces graduate students to practical skills and res ources related to research; such as, searching for literature review sources, data management basics, and citation management. We will also explore the dis semination of scholarship and the publishing landscape. Students are encouraged to utilize weekly activities and their final project to support their research and other scholarship. This course is recommended for graduate students working on a thesis, dissertation, or other large research project.

## UnSt - University Studies

## UnSt 101 - Race \& Social Justice (5)

This course will study biology that undermines the concept of race itself; sociology that defines the concept as socially constructed; a history that is not acknowledged in standard K -12 texts; and literature that opens a diversity of windows onto the experience of race. Through both increased knowled ge and personal reflection, students can develop capabilities useful to the work of moving U.S. society past its racial dilemma.

## UnSt 107 - Portland (5)

How do our surroundings shape our lives? How do we shape our surroundings? In this course, the complex relationship between people and the places in which we live, recreate, and work is explored. We specifically focus on Portland: its place as a context forhuman development and cultural expres sion; its place as an urban area of diverse communities; and its place within the natural, material, and social environment of the Pacific Northwest.

## UnSt 117 - Human/Nature (5)

The human animal is considered to be both a part of and yet distinct fromnature. This relationship between our human selves and the natural world we inhabit is complicated and perplexing. This theme explores the complex connections between humans and nature. Is there such a thing as human nature, and if so, what is it? How are we related to nature and the larger natural world? Over the course of the year, we will attempt to answer questions like these, drawing on the resources of the social and biological sciences, his tory, literature, and the arts.

## UnSt 121 - Design \& Society (5)

Designers influence the creation of products, images, infras tructure, and environments surrounding us, both virtual and real. Acting in a deliberate manner, designers engage with the problems facing their communities and act to solve themby developing pragmatic, creative, and innovative solutions. This course will use designers' activities as a lens across a variety of activities.

## UnSt 124 -Sustainability (5)

Although we often think of the natural world as separate from our largely urban lives, our most basic needs such as nutritious food to eat, clean air to breathe, and clean water to drink depend on the health of the natural systems of
which we are a part. This courseexplores the interconnectedness of global systems (including physical, ecological, cultural, social, and economic) and their impact on the world.

## UnSt 131 - The Work of Art (5)

Approaching art froma variety of disciplines, this course examines how the work of art shapes, reflects, dis guises, and complicates our pers onal and cultural identities. We explore the various roles that art plays in our imaginary, political, and social lives.

## UnSt 134 - Life Unlimited? (5)

This course delves into the fascinating relationship between non-living and living matter, life and death, nature and the artificial, humans and machines. Our inquiry starts with the fundamental question, "What is life?" We explore the ways the human search for"perfection" is embodied in various myths and utopian visions. As well as examining the risks and opportunities of technologies and how they redefine social relations and values.

## UnSt 141 - Power \& Imagination (5)

This course explores the interwoven relationships among domination, resistance, and empowerment--fromthe interpers onal to the global--through the stories of power and perception as they are represented in art and literature, science, and politics. His torical and contemporary case studies will help us understand the positiveconsequences and potential dangers of my thmaking.

## UnSt 144 - Health, Happiness, \& Human Rights (5)

This course examines the nature and state of healthy individuals and populations in their various environments. A dynamic approach is used to study the places where people live and interact, such as the community, the workplace, and the natural environment. Specific emphasis will be given to the intersections between health, communities (both local and global), and human rights and the impact on happiness.

## UnSt 147 - Immigration, Migration, \& Belonging (5)

The movement of people across borders is a central political and cultural issue throughout the world. Although many are aware of the mobility of goods and capital in a global economy, we tend to be less aware of the movement of people in the globaleconomic systemand we also tend to forget that the movement of people, both as workers and as refugees, is not a new phenomenon.

## UnSt 167 -What are Great Books? (5)

This theme focuses on some of the great literary works, watershed scientific discoveries, and seminal insights and creative acts that characterized the last two millennia of human thought and culture. To do so we will cross disciplines at every stage, working to unders tand how history, literature, art, philosophy, math, and science are not discrete disciplines but have always influenced and contributed profoundly to one another.

## UnSt 170 - Multilingual FRINQ/SINQ Lab (1-2)

Multilingual resident and international FRINQ/SINQ students collaborate to further develop skills and strategies for academic success. Course content includes targeted instruction in reading, writing, presentation, and class participation skills and is res ponsive to self-reported student needs. Instructors utilize materials from FRINQ/SINQ courses and provide students with individualized as sistance.

## UnSt 194 - College Success Topics (3)

College Success is a comprehensive course designed to enhance student success and retention. Students will learn strategies forcreating greater academic, professional, and personal success. Students will understand selfempowerment, pers onal responsibility, self-motivation, interdependence, self-awareness and other critical components of keeping themon course to their goals.

## UnSt 195 - Career Exploration (1)

Explores and explains the career planning process by engaging students in self-assessment and career exploration activities intended to as sist themin choosing a major or career.

## UnSt 196 - Summer Bridge Program (3)

The Summer Bridge Programis a TRiO/Student Support Services (SSS)joint partnership with PSU. Students will strengthen and use the academic skills needed for success at the University. Students will become familiar with the campus and visit classes to better understand the rigor and expectations of college courses.

## UnSt 197 - Academic Writing Support/Student Support Services (1)

The purpose of this course is to assist Student Support Services students with their academic writing. This class is
designed to support students who feel unprepared with the writing demands of college or who may feel the need for additional writing support. Instructor consent required.

## UnSt 198 - Roads to Success Inters ession (3)

Roads to Success is an early start programfornew freshmen at PSU designed to enhance student and academic success and retention at PSU. The course will examine effective college study strategies, selfempowerment theories, differences between high school and college, goal setting and engagement at PSU.
Corequisite: UnSt 298.
UnSt 199 - Special Studies (1-8)
(Credit to be arranged.)

## UnSt 210 - Sophomore Transition (4-5)

Contact department for more information on this course.

## UnSt 212 - American Identities (4)

American Studies examines the tensions, contradictions, traditions, and possibilities that define the American experience. Using perspectives from the humanities and social sciences, students will investigate ethical, social, political, geographic, and cultural developments. Courses may explore film, archaeology, literature, conflict resolution, music, as well as gender and sexualities in order to compare diverse American identities and how they have changed over time. Each class will examine key American narratives, symbols, policies, and places and can apply a broad range of cultural and historical perspectives.

## UnSt 220 - Community Studies (4)

This clusterexplores the nature of the communities we live in, whether defined spatially (such as a neighborhood) or as a set of ties based on sharing a common interest. Building community has become a central debate in a number of social sciences, including sociology, political science, economics, and psychology. In a culture emphasizing individualismand individual rights, how can needs for community and responsibility to others be balanced? Thus, in this cluster, students have the opportunity to gain practical as well as theoretical experience with building communities.

## UnSt 222 - Design <br> Thinking/Innovation/Entrepreneurship (4)

It's not enough to observe and talk about the world's problems; it's up to PSU students to solve them. The Design Thinking/Innovation/ Entrepreneurship (DTIE) clusterempowers students to develop the skills to deeply understand human and environmentalneeds and to address them with creative products and services. By using the Design Thinking methodology introduced in the Sophomore Inquiry course (UnSt 222) to identify needs, brainstorm solutions, incorporate feedback, iterate designs, and formulate enduring business models, students will work on projects that lead to las ting value. The cluster then allows students to harness innovation processes that will serve as touchstones in their careers and lives by drawing on approaches ranging fromthose used to create new social ventures in developing economies to entrepreneurial practices in Silicon Valley.

## UnSt 224 - Environmental Sustainability (4)

This cluster explores what we as humans are doing to our surroundings, the consequences of our actions, and what we should be doing to be more in harmony with the environment. By defining, characterizing, and understanding the en vironment, students will learn how to creatively promote and contribute to sustainability. They will accomplish this by investigating the possibilities of urban planning, studying literature and film, and analyzing the consequences of air and water pollution. Courses are designed to navigate a path through the scientific approach to analyze and solve environmental problems, socioeconomic concerns in environmental policy, and the historic and philosophical basis of our relationship to different ecosystems.

## UnSt 228 - Families and Society (4)

The Families and Society Clusterequips students with the skills to examine family forms in the United States, their intersections with social environments, contemporary challenges, and the effect of public policies on diverse contemporary families. This Cluster highlights theoretical models rooted in ecological systems, social justice, and social res ponsibility, as well as individual and micro-level family experiences. Students fromall majors who participate in the Families and Society Cluster will find the courses relevant to their own and others' family experiences, while also developing a foundation to enhance career development in a variety offields, such as education, business, social work, public health, and other health disciplines.

## UnSt 230 - Freedom, Privacy, and Technology (4)

The aim of this cluster is to provide the knowledge that will enable those whocomplete the cluster to face thoughtfully thequestion of the appropriate use of and limitations upon modern technology. One important feature of the cluster is that it brings together actual sciences with humanistic and social science disciplines.

## UnSt 231 - Gender and Sexuality Studies (4)

This Cluster includes a diverse selection of courses that foregrounds gender and sexuality as they relate to course material in the humanities, social sciences, and sciences. Students explore how gender and sexuality are contemporary socially-constructed concepts and deconstruct the labels and binaries society has placedon their experiences. By offering a profound senseof belonging, students engage in theoretical, personal, and social aspects of various sources in order to navigate their ideas and bodies toward deeperunderstanding of one's own, as well as others', experiences through critical thinking and community engagement.

## UnSt 232 - Global Environmental Change (4)

Students are barraged on a daily basis with news stories of El Nino, global warming, CO2 increasing, greenhouse effects, ozone hole, etc. This cluster will introduce some of the scientific concepts and is sues of natural global cycles and how the systems have changed in the past. We will discuss the physical, chemical and biological changes of the earth's environment in the past, present and future. The past will concentrate on the physical, chemical and biologicalchanges that are recorded in the rock, ice and sediment record. The present will concentrate on recent changes on the oceans and atmosphere, and discuss the human dimension. The future will discuss the merits and limits of global models.

## UnSt 233 - Global Perspectives (4)

The aim of this cluster is to introducestudents to the richness of cultures in Africa, Asia, Europe, Latin America, and the Middle East, drawing on perspectives from the humanities and social sciences. Through exploring the interplay between political, economic, environmental, and cultural sy stems, past and present, students will develop skills and attitudes tofunction as "globalcitizens."

## UnSt 234 - Healthy People/Healthy Places (4)

This clusterexamines the nature and state of healthy individuals in their various environments. A dynamic
approach will be used to study the places in which people live and interact, such as the community, the workplace and the naturalenvironment. Topics will focus on ways to solve and prevent problems that may affect the health and wellbeing of the individual, the local environmentand/or the global community. Individual behavior change, social policies, community development and social res ponsibility may be emphasized.

## UnSt 236 - Interpreting the Past (4)

In this cluster students explore our complexand interwovenhistories. While each of the courses has its own unique focus, they all have in common the useof interpretive tools the humanities and sciences offer us to examine evidence that has come from the past:that is , a prior human culture's literature, science, technology, and/or art. By concentrating on the pre-20th century world, we investigate the diversity of our shared human pastboth the continuities in human experiences across time and space, as well as the profound differences in the lives of people in other times andplaces. Interpreting continuities and changes in the past give students a necessary context for understanding the present.

## UnSt 239 - Knowledge, Values, and Rationality (4)

The theme of the cluster is the nature of rationality and its emergence from the interplay of knowledge and values. The curriculumexplores the major forms that human rationality takes in the acquisition of knowledge, logical inference, moral reas oning, decis ion making, and societal organizations and policy. Individual courses focus on models of rationality as such and conceptualizations of rationality in areas such as logic and inference, natural and social sciences, biomedicine and psy chiatry, social and political theory, low, educational policy, societal value conflicts, and moral theorizing including everyday ethical dilemmas. Human rationality is also approached froma comparative perspective that includes machine and animal learning including broader evolutionary perspectives. Finally, cluster courses offer critical perspective on perennial and popular doctrines that endorse non-rational or irrational approaches to existential and ethical questions, politics, and scientific inquiry.

## UnSt 242 - Leading Social Change (4)

The Leading Social Changeclusterexplores how to create change in society throughevery day acts of leadership. Students will explore elements of leadership such as identity, politics, and culture, and apply this knowledge to a range of social issues in a variety of social contexts where individual or community leadership is required. Through discussion of the implicit and explicit values that guide leaders, and the exploration of various sociocultural
contexts and issues, thecluster recognizes that everyone possesses the capacity for leadership. The cluster is ideal both for students who are interested in learning more about how leaders affect the world and who seek to explore leadership and develop their own leadership skills.

## UnSt 254 - Examining Popular Culture (4)

Popular Culture is generally associated with media and activities: music, movies, TV, Internet, advertising, sports, games, fashion, magazines, comic books-in short, "fun" stuff that many people enjoy. Pop culture offers a common ground that we, as theorist John Storey says, can use to get a fairly accurate read on the values and beliefs of contemporary American society, as well as cultures around the world. Through the process of myth reading and in recognizing and decoding signs of everyday life, students will observe, research, and write about cultural phenomena and gain experience with different methods while delving into popular media. The end goal of these courses is to gain control of, rather than being controlled by, the texts of popularculture.

## UnSt 286 - Science in Social Context (4)

The theme of this cluster is science-in-the-making or the ongoing process of active scientific inquiry - the processes of problem-posing, problemsolving, and persuasion. This thematic emphasis is applied to scientific inquiry in general, to the study of general natural science concepts, and to the analysis of scientific is sues in political, economic, social and ethical contexts.

Cross-Listed as: This is the same course as Sci 201.

## UnSt 298 - Roads to Success Fall Seminar (1)

Roads to Success fall seminar is a co-requisite to Roads to Success Intersession and continues the curriculumfrom the two-week course. Students are exposed to critical study skills, PSU resources for success and learn the important of becoming engaged members of the PSU community.
Corequisite: UnSt 198.
UnSt 299 - SelectedStudies (1-4)
(Credit to be arranged.)

## UnSt 310 - Transfer Transition (4-5)

Contact department for more information on this course.

## UnSt 321U- Learning in Action (4)

Applied learning experience in the UNST cluster. Two required parts: 1) Individual community internship,
volunteer experience, or project. 2) Online course exploring connections between disciplinary approaches in cluster and community work, different forms of engagement, intersections of race, clas s, and gender with community work, and development of professional skills.

## UnSt 389 - Transition from College to Your Professional Life (1)

This course is designed to assist Student Support Services upperclassmen transition fromcollege to career opportunities or graduate and/or professional programs. By providing assistance with these processes, we hopeour students will experience success in their various endeavors after graduation.

## UnSt 390 - TRiO Student Support Services - Transfer Student Bridge Program (2)

Introduction to personnel, resources, and systems at PSU. Through classroomactivities, discussions, group work, and presentations, the class aims to give transfer students a solid foundation for understanding how to successfully navigate their experience at PSU and get the mostout of their education.

Prerequisite: Admis sion to the TRiO SSS program.

## UnSt 394 - College Success Topics (3)

College Success is a comprehensive course designed to enhance student success and retention. Students will learn proven strategies for creating greater academic, professional, and personal success. Students will understand self-empowerment, personal res ponsibility, self-motivation, interdependence, self-awareness and other critical components of keeping themon course to their goals.

UnSt 399 - Special Studies (1-8)
(Credit to be arranged.)

## UnSt 401 - Research (1-4)

(Credit to be arranged.)

## UnSt 402 - Independent Study (1-9)

(Credit to be arranged.)

UnSt 404 - Cooperative Ed/Internship (1-8)
(Credit to be arranged.)

UnSt 405 - Reading and Conference (1-8)
(Credit to be arranged.)

## UnSt 406 -Special Projects (1-4)

(Credit to be arranged.)

## UnSt 407 -Seminar (1-6)

(Credit to be arranged.)

UnSt 408-Workshop(1-8)
(Credit to be arranged.)

## UnSt 409 - Practicum(0-4)

(Credit to be arranged.)

## UnSt 410 -SelectedStudies (1-6)

(Credit to be arranged.)

## UnSt 411 - Inquiry Mentor (3)

Contact department for more information on this course.

## UnSt 412 - Inquiry Mentor (1-4)

Contact department for more information on this course.

## UnSt 413 - Inquiry Mentor (1-3)

Contact department for more information on this course.

## UnSt 421 - Capstone (1-6)

The culmination of the University Studies programis the Caps tone courserequirement. This 6 -credit, communitybased learning course is designed to provide students with the opportunity to apply, in a team context, what they have learned in the major and in their other university studies courses to a real challenge emanating from the community. Interdisciplinary teams of students address these challenges and produce a summation product in a University Studies approved Capstone course under the instruction of PSU faculty member. The Capstone's purpose is to further enhance student learning while cultivating critical life abilities that are important both
academically and professionally:establishing connections within the larger community, developing strategies for analyzing and addressing problems, and working with others trained in fields different fromone's own. Independent volunteering, work experience, by arrangement credits, internships and practica cannot fulfill the Capstone requirement. Students musthave completed 90 credit hours before registering fortheir Capstone course. For a full description of each of the 220 Capstone courses, please visit the Capstone website at: http://capstone.unst.pdx.edu/.

## UnSt 450 - Mentoring in Higher Education (4)

Introduction to theories, research, and best practices for peer mentoring in highereducation. Focus is on is sues that impact the retention and success rates of college students. Students will develop their own frameworks, res ources, and skills to become effectivepeer mentors.

## UnSt 509-Practicum(1-4)

(Credit to be arranged.)

## UPA-Urban and Public Affairs

UPA 103 -CUPA Pathways: Student Success (4)
Focuses on identity, community and skill building for a successful and meaningful educational experience. Assignments enable the development of strong technical and communication skills, preparing students for academic and professional success. Autonomy, realistic educational objectives and support services are highlighted.

UPA 199-(1-12)

## UPA 335 -World Changing Jobs: Career Exploration

 (4)Expose students to a wide array of career related resources in urban and public affairs, allow for skill building and professional networking. Students will gain a better understanding of what career options would be a good fit for themand ways to use their educational experience for professional development purposes. Assignments will allow students to further develop communication, research, and presentation skills.

## UPA 399 -Special Studies (1-12)

(Credit to be arranged.)

UPA 401 - Research (1-6)
(Credit to be arranged.)

## UPA 402 - Independent Study (1-8)

(Credit to be arranged.)

## UPA 404 - Cooperative Ed/Internship (1-9)

(Credit to be arranged.)

## UPA 405-Reading \& Conference (1-6)

(Credit to be arranged.)

## UPA 407 -Seminar (4)

(Credit to be arranged.)

## UPA 408-Workshop(1-6)

(Credit to be arranged.)

## UPA 409 - Practicum (1-12)

(Credit to be arranged.)

## UPA 410 -SelectedStudies (1-6)

(Credit to be arranged.)

## UPA 425-CUPA Dean's Seminar (4)

An integrative course providing students with substantive opportunities to explore, connect and apply major theories and practices associated with urban and public affairs. Students will focus on issues of community resilience based in democratic participation for positive community change.
Prerequisite: Seniors tanding.

## USP - Urban Studies \& Planning

USP 199 -Special Studies (1-4)
(Credit to be arranged.)

## USP 233 - Real Estate Principles (3)

Surveys the legal, physical, andeconomic structure of the real estate market and the characteristics of realestate resources. Develops basic real estate valuation procedures and provides an overview of market analy sis and real es tate production, marketing and finance methods.

Prerequisite: Ec 201.

## USP 299 - Special Studies (1-4)

(Credit to be arranged.)

## USP 300U- Introduction to Urban Studies (4)

Introduction to the interdis ciplinary field of urban studies drawing on the urban planning, economics, geography, sociology, politics, and the humanities to provide basic concepts for understanding the urbanized world of the twenty-firstcentury. Cities as economic, social, and political systems and ways in which people have thought about cities.

USP 300-(4)
Introduction to Urban Studies (4)

Introduction to the interdis ciplinary field of urban studies drawing on the urban planning, economics, geography, sociology politics, and the humanities to provide basic concepts for understanding the urbanized world of the twenty-firstcentury. Cities as economic, social, and political systems and ways in which people have thought about cities.

## USP 301U- Introduction to Community Development (4)

An inves tigation of concepts, models and perspectives of community development practice. Explores social, cultural, religious, politicaleconomic and environmental as pects that affect community development practice. Asset-based and sustainable human development models and action research are emphasized. The course utilizes teaching cases and experts fromthe field and requires substantial reading reflection and dis cussion.

## USP 302 - Theory and Philosophy of Community Development (4)

New approaches to the philosophy of community; theory and comparative practice; and case study of local theory
and practice, presentation of an in-depth case study from the Pacific Northwest.

Prerequisite: USP 301.

## USP 311 U- Introduction to Urban Planning (4)

An interdisciplinary perspective on planning theories, principles, and practice. Focuses on the planning process, particularly at the local level. Explores the political, economic, social, and legal forces that influence the planning function and the roles of planners. Changing concepts in practice are also considered. Recommended prerequisite: upper-division standing.

## USP 312U - Urban Housing and Development (4)

Problems of housing, development, and redevelopmentin an urban setting are analyzed fromeconomic, demographic, and planning perspectives. Introduction to the nature of the urban economy and residential location, with a focus on housing problems and their as sociated social, physical, and racial aspects. Role of federal and community-based housing policies and programs. Recommended prerequis ite: USP 311.

## USP 313U - Urban Environmental Issues (4)

Environmental is sues and problems are evaluated in the urban context. The course addresses both the origins of urban environmental problems and their economic and social implications. Finding solutions that attempt to achieve balance between social, economic, and ecological factors is addressed in the context of urban environmental policy, planning and community activism.

## USP 314U - The Global City in Film (4)

Critically examines urban social issues reflected in films from different countries. Course includes in-class screening, lecture and discussion, and film review writing exercises. Topics for dis cussion include the urb an form, is sues of race, gender and social class, the relationships among communities, political authority, industry, commerce, police, street gangs, criminals, public schools, and other institutions and denizens of the city.
Cross-Listed as: This is the same course as Int1314U and may be taken only once for credit.

## USP 316 - Community Organizing and Social Change

 (4)Community organizing seeks to involve people in collective action to address is sues of socialchange and social justice. This course covers thehis tory, philosophy and goals of community organizing and various elements
of the organizing process. Case studies will provide the basics for the development of action plans.

## USP 317U - Introduction to International Community Development (4)

An inves tigation of concepts, models, and perspectives of International Community Development practice. Explores social, cultural, religious, political, economic, and environmentalaspects that affect community development practice in the Third or Developing World. Asset-based and sustainable human development models and action research are emphasized. The course utilizes teaching cases and experts fromthe field and requires substantial reading, reflection and discussion.

## USP 323U- Real Estate Development and Finance (4)

Examines urban realestate development, including location of activities within metropolitan areas, public/priv ate partnerships, downtown redevelopment, and affordable housing. Presents tools toevaluate the financial feasibility and performance of a project, including discounting of cash flows and pro forma analysis. Uses a case study method showing how the design, development, market, finance, construction, and management of the project are integrated.

## USP 324U- Healthy Communities (4)

Addresses major is sues at the intersection of urban policy and planning and individual and community health. Relationships between the ways in which land is used, the trans portation choices available, and the health of both urban places and city residents is explored in light of growing concern about increased rates of various health problems. Health consequences of political, economic, and social as pects of metropolitan life are also examined. Movements and programs to create and maintain healthy communities around the world are analyzed.

## USP 325U- Community and the Built Environment (4)

This course examines the relationships between urban form and social patterns, and efforts by urban designers to influence community life by shaping the built environment. The history of ideas about urban formand community development, and the history of proposed and implemented projects will be surveyed, and their relevance for contemporary urban planning and design practices will be as sessed. Initiatives in the Portland metropolitan area to enhance community livability will be studied.

## USP 326U - Neighborhood Change and Gentrification (4)

The dynamics of neighborhood development, including economic and institutional factors in neighborhood change; neighborhood definition and image, residential choice; residential segregation; neighborhoods in the political process; and neighborhood conservation strategies.

## USP 350U - Inclusive Engagement (4)

Examination of principles, methods, and programs for giving explicit attention to the perspectives of the public in the development and implementation of public policies and programs. Sets public participation in its historical context with an as sessment of its impact to date. Participation from the pers pective of both the public and the government will be covered as will the variety of approaches for achie ving participationgoals andobjectives.

## USP 360 - Real Estate Finance I (4)

Application of finance and economic principles to analysis of realestate finance and investments. Emphasis on the development of problem solving capabilities through the use of computer application programs. Special attention is given to risk analys is, alternative mortgage instruments, hedging techniques, and the taxeffects of realestate investment.
Prerequisite:Ec 201. . Cross-Listed as:The course is cross listed as RE 360 , and may only be taken once forcredit.

## USP 385U - History of American Cities (4)

Traces the evolution of urban centers from the colonial period to the present. Focuses on the developing system of cities, on growth within cities, and on the expansion of public responsibility for the welfare of urban residents. Particular attention is given to the industrial and modern eras. Recommended prerequisite: upper-division standing. Also listed as Hst 337. May be taken only once for credit.

## USP 386U - Portland Past and Present (4)

Begins with the geological/geographical foundations of Portland then briefly explores Portland's original inhabitants, early exploration and commercial growth. Particular attention is paid to the 20th century and the plans and projects that have guided Portland's develop ment over the past 100 years. Considers the shaping of Portland as a regional city, examining the evolving cityscape, architecture, land use, and transportation, and its development frompolitical, social, economic, and cultural perspectives.

## USP 399 -Special Studies (1-6)

(Credit to be arranged.)

## USP 401 - Research (0-6)

(Credit to be arranged.) Consent of instructor.

USP 402 - Independent Study (1-8)
(Credit to be arranged.)

USP 403-Thesis (1-12)
(Credit to be arranged.)

## USP 404 - Cooperative Education/Internship (0-9)

(Credit to be arranged.)

## USP 405 - Reading and Conference (0-6)

(Credit to be arranged.)

USP 406 - Problems/Projects (1-8)
(Credit to be arranged.)

USP 407 -Seminar (1-6)
(Credit to be arranged.)

USP 407U - Seminar (4)
(Credit to be arranged.)

## USP 408-Workshop(0-6)

(Credit to be arranged.)

USP 409 - Practicum(0-12)
(Credit to be arranged.) Consent of ins tructor.

## USP 410 - SelectedTopics (1-6)

(Credit to be arranged.)

## USP 411 -Pedestrian and Bicycle Planning Lab (3)

A practical approach to bicycle and pedestrian planning and design through a project-based course that focuses on all aspects of the planning process. Students research and develop solutions to a practical challenge in the Portland region and present recommendations in report and presentation form. Co-registered with USP 465 or USP 565 or have taken USP 465 or 565 within the past two years.
Also offered for graduate-level credit as USP 511 and may be taken only once for credit. Prerequis ite: Junior standing.

## USP 413 - Public Space (4)

An introduction to the study of public spaces in American cities, with a special focus on Portland. Key readings include history and theory of concepts of public space, as well as contemporary case studies and field assignments to understand the production and maintenance of public spaces around Portland.
Also offered for graduate credit as USP 513 and may be taken only once for credit. Prerequisite: upper-division or graduate-level standing.

## USP 414 - Trans portation Seminar (1)

This weekly seminar features a different speaker each week covering various topics in transportation research and practice. The topics cover all modes of transportation, with a focus on current practice. This course may be taken for credit up to three times.
Also offered for graduate-level credit as USP 514 and may be taken only onceforcredit. Cross-Listed as:This is the same course as CE414.

## USP 416 - International Urban Issues Seminar (1)

This seminar surveys research about local and regional planning issues in a global context. It brings speakers with international experiences to share their understanding of urban is sues, and to reflect on cultural, economic, and socio-political dimensions of policy-making processes around the world that influence planning world wide.

Also offered for graduate-level credit as USP 516.
Prerequisite: Upper-division standing.

## USP 419 - Population and Society (4)

Survey and analysis of population dynamics (births, deaths, and migration) and society. Examination of demographic concepts, theories, data and measurements, and research. Role of population processes in social life and public policies are highlighted, including population aging, economic development and the environment, urbanization, health and health care, race andethnicity, and government/social/business planning. This course is the same as Soc 441 and may only be taken once for credit.

Also offered for graduate-level credit as USP 519 and may be taken only once for credit. Prerequisite: Soc 200. CrossListed as: Soc 441.

## USP 427-Commercial District Revitalization (3)

Examines the evolution and revitalization of commercial districts over time. It explores the role of commercial districts in contemporary urban regions, and introduces the concepts of commercial district management and other strategies for promoting vital urban centers. Through readings, field observations, classroomdiscussions, and a series of as signments, students will explore the interrelationships between the built environment, economic trends, and public policy in shaping the commercial districts we see today. Students should learn to understand commercial districts as complex and multifaceted places that are always changing and unpredictable, but often play a crucial role in a community's identity and purpose and in supporting affordability, equity, and sustainability.
Also offered for graduate-level credit as USP 527 and may be taken only once for credit. Prerequisite: Upper-division standing.

## USP 428 - Concepts of Community Development (4)

An investigation of models and perspectives on community development. Both structural and dynamic concepts related to processes of community- based change will be explored, including methodological approaches for as sessing community settings, and the various roles and relationships in a community-based decision environment. Includes required field observation and a substantial independent field research project which examines cases of community problem-solving. Graduate students undertake a substantial independent project in addition to other course requirements.
Also offered for graduate-level credit as USP 528 and may be taken only once for credit. Prerequisite: USP 301 for undergraduates.

## USP 429 - Poverty in the Urban Community (3)

An introductory course about the nature, extent, and causes of poverty in the United States. It covers a brief his torical overview, demographics and trends, explanations of poverty, and anti-poverty policies. Questions of race, gender, and the spatial manifestation of poverty will be addressed.

## USP 430 - Participatory Research Methods for Community Development (4)

This course introduces students to participatory methods, placing special emphasis on research ethics, the positionality of the researcher, and embedding research within community development practice. It focuses on research design, data collection, data analysis, and the
dissemination of results. Various approaches to measuring urban phenomenaare covered, including basic interview techniques, survey methods, and quantitative analytical methods.

## USP 431 - Urban Economics (4)

Functions of the urban economy: the market sector and the public sector. Economic analysis of issues such as land use, environmental quality, transportation, housing, income distribution, and financing of urb an public services. This is the same course as Ec 431 and RE 431 may only be taken once forcredit.
Prerequisite: Ec 201. Cross-Listed as: Ec 431 and RE 431.

## USP 434 - Green Buildings (3)

An overview of contemporary green building practices and the design and development processes essentialto their success. Emphasis on strategies that have thehighest economic return and/or the greatestenvironmental benefits. The full lifecycle of the built environment is considered, fromplanning and design through construction, operation, and the end of use.
Also offered for graduate-level credit as USP 534 and may be taken only once forcredit. Prerequis ite: Upper division standing.
USP 438 - Real Estate Law (3)
Provides students with a comprehensive summary of real property froma legal perspective with an emphasis on trans actional issues. Includes is sues relating to types of ownership, descriptions of property, easements, public and private limitations on use, realestate contracts, forms utilized in transfers, financing and title assurances. The class will enable students to understand the legal framework and the rights and res ponsibilities of owners and transferors/transferees of real property. This is the same course as RE438 and may be taken only once for credit. Expected preparation for graduates tudents: RE 521.
Also offered for graduate-level credit as USP 538 and may be taken only once for credit. Prerequis ite: Ec 201
(undergraduates). .Cross-Listed as:RE438.

## USP 439 - Workforce Development (3)

Introduction to policies and practices for workforce development. Topics discussed include labor market dynamics, failures and inequities; tools and methods for urban labor market analysis; and workforce de velopment policies for skill investment, job matching and career development toward goals of household, business, community and regional economic development.
Also offered for graduate-level credit as USP 539 and may be taken only once for credit. Prerequis ite: Upper-division standing.

## USP 440 - Critical Analysis of Community Data (4)

Applied research methods and essential data skills for quantitatively meas uring social, economic, and demographic trends across urban places. Discussion of theoretical, practical, andethical issues related to quantify ing populations and places as well as interpreting and presenting findings.
Prerequisite: upper-division standing.

## USP $\mathbf{4 4 5}$ - Cities and Third World Development (3)

Critical survey of his torical, economic, cultural, political, and urban aspects of Third World development, starting with the colonial era. Historical patterns of integration of the Third World with the emerging world market system. Covers problems of the post-independence period, focusing on urban sectoral is sues and policy alternatives. Specific topics include trade, investment, industrialization, finance, technology transfer, political participation, land use, housing, transportation, information infrastructure, population growth, social services, militaris m , and cultural conflict. This is the same course as Int1445 and may be taken only once for credit.
Also offered for graduate-level credit as USP 545 and may be taken only once for credit. Cross-Listed as: Intl445.

## USP 451 - Community Economic Development (3)

Course sets community economic development within the context of traditional state and localeconomic development policy and compares theirunderlying theoretical pers pectives. It examines the impact of recent economic, social, and demographic transformations on locallabor markets and surveys the labor-market problem solving activities of local governments and communitybased organizations. Business and commercial development strategies are also explored.
Also offered for graduate-level credit as USP 551 and may be taken only once for credit.

## USP 452 - GIS for Community Development (4)

This course uses lab exercises and lectures to help students develop an in-depth understanding and basic skills for the uses of geographic information systems in community development and planning.
Prerequisite: upper-division standing.

## USP 455 -Land Use: Legal Aspects (3)

Land use and planning fromthe legal perspective. Includes historical review of attitudes toward property tenure and ownership; the relationship between local planning and regulations; and current is sues and perspectives on land use including emerging state and federal roles. Graduate students undertake a substantial independent project in addition to other requirements.

Also offered for graduate-level credit as USP 555 and may be taken only onceforcredit.

## USP 456 - Urban Transportation: Problems and Policies (3)

An introduction to urban transportation policy froma historical and political perspective. Historical developments in transportation policy are traced from the early streetcar days up through the present. Federal, state, and local trans portation policies are examined for their impact on urban spatial and economic development. An overview of current issues in transportation policy and planning includes transportation demand management strategies, transit- oriented design, road pricing, and alternative transportation modes. The intersection of environmental and tran sportation policy is also examined, as is the decision-making structure at the local, regional, and state level.
Also offered for graduate-level credit as USP 556 and may be taken only once for credit.

## USP 457 - Information Cities (3)

Focuses on the political, social, and cultural impacts of mass media and information technologies within the urban matrix. Contextualizes the "information society" in historical, institutional, political, economic, and global settings. Topics include the flexible production, the segmentation of consumption, alternatives to mass media, the Web, the reorganization of work, the trans nationalization of culture, commercial and political surveillance, and the development of urban information infrastructure.
Also offered for graduate-level credit as USP 557 and may be taken only once for credit.
USP 460 - Community Development Field Seminar (26)

Participant observation through placement in a community-based organization actively engaged in community development activities on behalf of a specific community, and critical reflection on the placement experience. Culminating experience for the Community Development major. This course is repeatable for up to 6 credits.

Prerequisite: Completion of the Community Development Core (USP 300U, 301, and 302) and at least one course from among those listed as Methods in Community Development (USP 350U, USP 430, USP 440, or USP 452).

## USP 465 - Pedestrian and Bicycle Planning (3)

Examines the importance of walking and bicycling as means of transportation in a sustainable urban environment. Covers planning, design, implementation, and maintenance of bikeways and walkways, as well as
ancillary facilities such as bicycle parking. Focus on the role of education, advocacy, and outreach in improving walking and bicycling conditions. Study relevant examples from various cities, with a heavy emphasis on Portland's experience.
Also offered for graduate-level credit as USP 565 and may be taken only oncefor credit.

## USP 468-Oregon Land Use Law (3)

The Oreg on programis placed in a national context that stres ses the broad nature of planning here. Structural relations between state, regional, and local government planning and regulation are analyzed. Legal aspects of the implementation of the various functional statewide planning goals are studied, as are the OregonLand Use Board of Appeals and recent developments in local government land use planning and regulatory processes.
Also offered for graduate-level credit as USP 568 and may be taken only oncefor credit.

## USP 475 - Urban Design Workshop (4)

The workshop will explore the use of urban design as an integral part of the planning process through the creation of an urban design plan. Projects in the Portland region will be chosen to familiarize students with the practice of urban design planning and the products of the workshop will be presented to the public.
Also offered for graduate-level credit as USP 575 and may be taken only once for credit. Prerequisite: Enrollment in good standing in the MARCH or MURP graduate degree programs or permission of the instructor.

## USP 480 - Political Economy of Nonprofit Organizations (3)

Considers theories of altruism, trust, and social capital. Examines the connections between wealth and social responsibility and between elite status and social reproduction. Explores the broad scope of non profit activity in the economy, theinterdependenceof government and nonprofit organizations in the modern state, and the role of think tanks in shaping public policy. Surveys the dramatic rise of non-governmental org anizations in developing countries and the future of nonprofits in a globaleconomy.
Also offered for graduate-level credit as USP 580 and may be taken only oncefor credit.

## USP 485 - Housing Environments for Older Adults (3)

Explores physical, social, and service contexts related to housing andenvironments for people across the age and ability spectrums, focusing on older adults. Ecological pers pectives and social theories on aging will be examined and applied and students will examine evidence regarding how older adults use, perceive, and are affected by their homes and environments. Topics include housing options,
acces sible and inclusiveenvironments, supports and services, policies and politics, economics, neighborhood design, and age-friendly communities.
Also offered for graduate-level credit as USP 585 and may be taken only onceforcredit. Prerequisite: Upper-division standing.

## USP 490 - Green Economics and Sus tainable Development (3)

Examines prevailing as sumptions about economic growth, production, consumption, labor, and leisure. Considers how changes in these basic assumptions might help us design an economic systemthat includes alternative values such as appropriate scale, community impact and environmental sustainability.
Also offered for graduate-level credit as USP 590 and may be taken only onceforcredit.

## USP 493 - Public Participation GIS (3)

Offered as a studio-based GIS class. The objective is for students to apply GIS skills acquired in previous GIS courses to a specific real-world spatial problem. Tasks will involve problemdefinition, primary data collection, advanced GIS analys is, and presentation of results. This format will give students practical experience in implementing GIS technologies with specific emphasis on planning problems. Students will be required to work in small groups in a simulated professional planning practice environment. Expected preparation: USP 531 and USP 543 or USP 591 and USP 592.

Also offered for graduate-level credit as USP 593 and may be taken only onceforcredit.

## USP 496 - Affordable Housing Finance (3)

Introduction to the uniquechallenges of financing and developing affordable housing projects. The challenges and tools for financing rental as well as owner-occupied housing will be covered, and case studies will be used to illustrate the ways in which financing for affordable housing is created and used, and poses unique challenges for investors, juris dictions, and community-based groups. Expected preparation: USP 312.
Also offered for graduate-level credit as USP 596 and may be taken only onceforcredit.
USP 498 - Introduction to Finance and Real Estate (3)
Designed for students seeking the graduate certificate in real estate development who have little or no business education, or for those students who desire a course in basic finance and realestateconcepts and techniques. Introduces business finance within the context of commercial real estate. Concepts and techniques will include financial statements, analysis, and forecasting; present value and discounted cash flow analysis, an introduction to real estate valuation measurements; and
analys is of performance risk versus return. Students also receive an overview of the legal definitions of real estate and its forms of ownership, as well as an overview of real estate title, contract, regulation, and financing is sues. Recommended prerequisites: Ec 201 and 202.

## USP 499 - Real Estate Finance and Investments (3)

Application of finance and economic principles to analysis of real estate finance and investments. Emphasis on the development of problemsolving capabilities through the use of computer application programs. Special attention is given to risk analys is, alternative mortgage instruments, hedging techniques, and the taxeffects of reales tate investment.

## USP 501 - Research (0-9)

(Credit to be arranged.) Consent of instructor.

USP 502 - Independent Study (1-9)
(Credit to be arranged.)

USP 503 - Thesis (0-9)
(Credit to be arranged.)

## USP 504 - Cooperative Education/Internship (1-9)

(Credit to be arranged.)

## USP 505 - Reading and Conference (0-6)

(Credit to be arranged.)

## USP 506 - Projects (1-9)

(Credit to be arranged.)

USP 507 - Seminar (1-6)
(Credit to be arranged.)

## USP 508 - Workshop(0-6)

(Credit to be arranged.)

USP 509-Practicum(0-9)
(Credit to be arranged.) Consent of instructor.

## USP 510 -Selected Topics (0-6)

(Credit to be arranged.)

## USP 511 -Pedestrian and Bicycle Planning Lab(3)

A practical approach to bicycle and pedestrian planning and designthrough a project-based course that focuses on all aspects of the planning process. Students research and develop solutions to a practical challenge in the Portland region and present recommendations in report and presentation form. Co-registered with USP 465 or USP 565 or have taken USP 465 or 565 within the pasttwo years.
Also offered for undergraduate-levelcredit as USP 411 and may be taken only once for credit. Prerequis ite: junior standing.

## USP 512 - Environmental Planning Methods (3)

Examination of the patterns and processes in humandominated landscapes, and the tools forunderstanding human behavior and decision making. By applying several environmental planning tools to managing landscapes, this course aims to provide students with skills to translate data into information. Topics covered include, land conservation, impact of land useon watersheds, sustainability design, environmental impact as sessments, and environmental modeling and simulation. Focus is on the application of tools to addressing pressing problems of regionalsignificance. Recommended prerequisites: USP 531 or Geog 488/588.

## USP 513 -Public Space (4)

An introduction to the study of public spaces in American cities, with a special focus on Portland. Key readings include his tory and theory of concepts of public space, as well as contemporary case studies and field assignments to understand the production and maintenance of public spaces around Portland.
Also offered for undergraduate credit as USP413 and may be taken only once for credit. Prerequisite: upper-division or graduate-level standing.

## USP 514 - Transportation Seminar (1)

This weekly seminar features a different speaker each week covering various topics in transportation research and practice. The topics cover all modes of transportation, with a focus on current practice. This course may be taken for credit up to three times.
Also offered for undergraduate-level credit as USP 414 and may be taken only once for credit. Cross-Listed as: This is the same course as CE514.

## USP 515 - Economics: Applications in Urban Studies

(4)

Microeconomic analysis of individual and firm behavior is developed with emphasis on applications to urban studies. Topics which may be covered include: land use and land rents, urban structure, poverty, housing and slums, transportation, environmental quality, and local government finance.

## USP 516 - International Urban Issues Seminar (1)

This seminarsurveys research about local and regional planning is sues in a global context. It brings speakers with international experiences to share their understanding of urban issues, and to reflect on cultural, economic, and socio-political dimensions of policy-making processes around the world that influence planning worldwide.
Also offered for undergraduate-level credit as USP 416.

## USP 517 - Urban Economic Development Policy (3)

This course analyzes urban economic development policy by building on an overall framework that demonstrates how urban economies create and distribute wealth and affect citizens' quality of life. Federal, state, and local policies must pursue three broad objectives: 1. rais ing the area's standard of living; 2 . preserving and protecting environmentalquality andquality-of-life; 3 . reducing poverty and income inequality. This course provides students the ability to analyze and assess alternative policies through an understanding of the theoretical found ations of urban growth and decline; through the ability to apply analytical methods for assessing policy effectiveness; by examination of evidence of policy effectiveness; by reviewing casestudies; and via a student's personal research of specific urban problems.
Prerequisite: USP 515 or equivalent courses in economics.

## USP 518 - Energy and Society (3)

Consideration of the role of energy in human society, including energy and social change, energy andurban form, technologies of energy supply and demand, social institutions governing access to energy, and cultures of consumption. Current social issues involving energy efficiency, renewable energy technologies and climate change are stressed.

## USP 519 - Population and Society (4)

Survey and analysis of population dynamics (births, deaths, and migration) and society. Examination of demographic concepts, theories, data and measurements, and research. Role of population processes in social life and public policies are highlighted, including population aging, economic development and the environment,
urbanization, health and health care, race and ethnicity, and government/social/business planning. This course is the same as Soc 541and may only be taken once for credit.
Also offered for undergraduate-level credit as USP 419 and may be taken only once for credit. Prerequisite: Soc 200. Cross-Listed as: Soc 541.

## USP 520 - Applied Demographic Methods I (4)

The first of a two-course sequence. The purpose is to introduce the various basic methods of demographic analys is. The topics to be covered include datas ources, population characteristics and change, and measures of mortality and fertility. In addition, the course will help students develop good judgment about data availability and quality, and acquire skills for presenting data.
Recommended prerequisite: a course in regression analys is, such as USP 534.

## USP 521 - Applied Demographic Methods II (4)

The second of a two-course sequence. The purpose is to introduce more advanced methods of applied demographic analys is. The topics to be covered are: data sources, internal and international migration, data evaluation, population estimates, and projection projections. The course will cons is t of readings, lectures, laboratory ses sions, homework exercises, one examination, and one term-long project.

## USP 522 - Practicumin Applied Demography (4)

Represents the capstone course for the graduate concentration in applied demography. The focus is on integrating a practicumexperience with the methods of applied demography into a research paper. Students will develop, revise, and resubmit numerous drafts of a final research paper. Students will also provide professional peer review in evaluating the development of fellow studentresearch papers.

## USP 523 - Real Estate Development I (4)

Evaluates the new public/private partnerships that are neces sary for downtown redevelopment, historic rehabilitation, integrated mixed-use urban centers, urban villages, and new communities. Students will analyze the critical conceptual, feasibility, and deal-making phases of the development process, as well as the development and management stages. The course examines the new affirmative roles played by both public and private developers, as well as unusual joint development entities. Also considered are innovative concepts of incremental growth, land and development banking, shared parking, and alternative development patterns. Expected
preparation: USP 515 or Fin 598 (may be taken concurrently).

## USP 524 -Site Planning (3)

This course introduces the fundamentals of site planning in an urban context, as well as contemporary urban design theory and practice. Students will learn the principles of site planning and urban design at the scale of urban centers and specific sites, as well as the synthesis of multiple design decisions made by different actors, at different times, about different properties. The course will explore these topics from various perspectives, including planners and designers, developers and regulators, and others. Slideshow lectures, downtown walking tours, and a term project will use Portland as a living laboratory for how the principles of urban design and site planning are played out in public and private development projects. Students will work in teams to apply class principles to a specific site that is currently slated for redevelopment.

## USP 525 - Design Analys is in Planning (2)

Approaches to the analysis of design issues in urban planning. The definition of urban space through mass, rhythm, and scale. Design and urban circulation. Planning tools for the implementation of design goals.

## USP 526 - Neighborhood Conservation and Change (4)

The dynamics of neighborhood development, including economic and institutional factors in neighborhood change; neighborhood definition and image, residential choice; residential segregation; neighborhoods in the political process; and neighborhood conservation strategies. Recommended prerequis ite: junior standing. Graduate students undertake a substantial independent project in addition to other course requirements.

## USP 527-Commercial District Revitalization (3)

Examines the evolution and revitalization of commercial districts over time. It explores the role of commercial districts in contemporary urban regions, and introduces the concepts of commercial dis trict management and other strategies for promoting vital urban centers. Through readings, field observations, classroomdis cussions, and a series of as signments, students will explore the interrelationships between the built environment, economic trends, and public policy in shaping the commercial districts we see today. Students should learn to understand commercial districts as complexand multifaceted places that are always changing and unpredictable, but often play a crucial role in a community's identity and purpose and in supporting affordability, equity, and sustainability.

Also offered for undergraduate-levelcredit as USP 427 and may be taken only once for credit.

## USP 528 - Concepts of Community Development (3)

An investigation of models and perspectives on community development. Both structural and dynamic concepts related to processes of community-based change will be explored, including methodological approaches for as sessing community settings, and the various roles and relationships in a community-based decision environment. Includes required field observation and a substantial independent field research project which examines cases of community problem-solving. Graduate students undertakea substantial independent project in addition to other course requirements.

Also offered for undergraduate-level credit as USP 428 and may be taken only once for credit.

## USP 530 - Building Community Resilience (4)

Introduction to resilience theory, concepts, and applications in a hazards planning and dis aster management. Surveys sociological, public administration, and planning theory literature to understand risk, resilience, and methods to address these at the community level.

Cross-Listed as: This is the same course as EMCR 530 and may be taken only once for credit.

## USP 531 - Geographic Information Sys tems (GIS) for Planners (4)

Introduction to principles and methods of collecting, org anizing, analyzing, and visualizing geographic information. Explores types and sources of geographical data used in urban and regional studies and planning with an emphas is on Census data. Provides an overview of principles and components of Geographic Information Systems (GIS) as a primary tool of spatial data analy sis and visualization. Attention is givento practical applications of GIS and to developing essential skills in desktop mapping and spread sheet software.

## USP 532 - Data Collection (4)

The acquisition of data for research in an urban context. Emphas is is on the concepts, terminology, and methods related to the use of survey research and secondary data. Recommended prerequisite: USP 430 and/or an introductory undergraduate statistics sequence and USP 530.

## USP 533 - Planning Methods I (4)

Introduction to applied research in planning with emphasis on problemdefinition, planning and policy research
design, collection and analysis for secondary data, and the use of qualitative observations.
Prerequisite: undergraduate statis tics course.

## USP 534 - Green Buildings (3)

An overview of contemporary green building practices and the design and development processes essential to their success. Emphasis on strategies that have the highest economic return and/or the greatest environmental benefits. The full lifecycle of the built environment is considered, fromplanning and design through construction, operation, and the end of use.
Also offered for undergraduate-level credit as USP 434 and may be taken only once forcredit.

## USP 535 - Planning Methods II (4)

Continuation of USP 533 focusing on statistics, forecasting, interpretation, and presentation of data in the context of planning practice.
Prerequisite: USP 533.

## USP 536 - Policy Evaluation Methods (3)

Focuses on the methodological is sues that must be addressed in attempting to evaluate programs and policies. Course offers an introduction to a variety of techniques useful in policy evaluation. Topics which may be covered include difference equations, Markov models, and queuing models. A section of the course considers the methodological issues that arise in cost-benefit analysis, such as present value calculations, determining the value of non-market benefits, and correctly evaluating costs. Recommended prerequisite: USP 515 or equivalent.

## USP 537 - Economics of Urban Transportation (3)

The trans portation system is critical to the functioning of an urban area. The movement of people and goods affects both the productivity and livability of the region. Trans portation systems also affect and are affected by land use and location decisions. This course presents the economic analysis of urban transportation. This will include analysis of the effects of tran sportation systems on land use and location as well as the evaluation of trans portation investments. These methods will then be applied to evaluation of various proposals to improve the urban transportation system. Recommended prerequisite: USP 515 or615.

## USP 538 - Real Estate Law (3)

Provides students with a comprehensive summary of real property froma legal perspective with an emphasis on trans actional is sues. Includes is sues relating to types of ownership, descriptions of property, easements, public and
private limitations on use, real es tate contracts, forms utilized in transfers, financing and title assurances. The class will enable students to understand the legal framework and the rights and res ponsibilities of owners and transferors/transferees of realproperty. This is the same course as RE538S and may be taken only once for credit. Expected preparation for graduate students: RE 521.
Also offered for undergraduate-level credit as USP 438 and may be taken only once for credit. Cross-Listed as:RE 538S.

## USP 539 - Workforce Development (3)

Introduction to policies and practices for workforce development. Topics discussed include labor market dynamics, failures and inequities; tools and methods for urban labor market analysis; and workforce development policies for skill investment, job matching and career development toward goals of household, business, community and regional economic development.

Also offered for undergraduate-level credit as USP 439 and may be taken only once for credit.

## USP 540 - History and Theory of Planning (4)

The evolution of the urban planning field from its 19th century European origins through the 20th century U.S. history. Course addresses the question: why do we produce and implement plans? Specific topics include: philosophicalissues and political-organization contexts of professional activity; the placeof planning in the political economy of U.S. metropolitan development; and problems of rationality in forecasting, analysis, decision making, and design.

## USP 541 - Dynamics of Planning Practice (3)

Examination of principles, methods, and programs for giving explicit attention to the perspectives of citizens in the development and implementation of public policies, programs and planmaking. Sets citizen participation in its his torical context with an assessment of its impact to date. Examines is sues pertaining to working with diverse communities and highlights ethical dilemmas faced by professional planners.

## USP 542 - Land Use Implementation (3)

An examination of alternative approaches to implementation of plans. Topics include: regulatory tools, e.g., zoning and subdivision ordinances; review functions, e.g., design review and administrative review; and programs, e.g., growth management, capital improvements, community development, housing assistance plans; and political-procedural is sues, e.g., permit streamlining, cost impacts.

## USP 543 - Geographic Applications to Planning (4)

Principles and models of spatial org anization, behavior, and location in geographic space. Major conceptual models of urban structure and form, urban regional hierarchy, trans portation flows and other forms of spatial interaction, and their applications to modern planning and other disciplines. Spatial data models (rasters, TINs, LRSs, other) and advanced analytical and modeling capabilities of GIS (surface, 3-D, and network analyses). Dis cussion of real-life GIS applications to transportation, land use, environmental planning, community development, and related areas.

## USP 544 - Urban Transportation Planning (3)

Introduces fundamental concepts and methods used in multi-modal urban transportation planning, including problemidentification, alternatives analysis, evaluation and decision making, plan implementation, and program management. Exposes students to processes and analytical methods frommultiple disciplines, such as law, politics, engineering, sociology, economics, finance, management and marketing. Emphas is on analysis of moderately complex technical information and its interpretation for communication with decision makers.
Prerequisite: USP 535 or equivalent coursework in descriptive and inferential statistics and data presentation. Recommended: USP 515 or USP 537 or an equivalent intermediate-level course in applied microeconomics.

## USP 545 - Cities and Third World Development (3)

Critical survey of historical, economic, cultural, political, and urban aspects of Third World development, starting with the colonial era. Historical patterns of integration of the Third World with the emerging world market system. Covers problems of the post-independence period, focusing on urban sectoral is sues and policy alternatives. Specific topics include trade, investment, industrialization, finance, technology transfer, political participation, land use, housing, transportation, information infrastructure, population growth, social services, militarism, and cultural conflict.
Also offered for undergraduate-level credit as USP 445 and may be taken only once for credit.

## USP 546 - Real Estate Development II (3)

Introduces students to persistent and emerging challenges of real estate development through analysis of case studies. Provides students the experience of developing a comprehensive and unified analysis of a commercial real es tate project. Each student will submit a case study with greater specificity showing how the design, development, market, finance, construction, and management of the
project are integrated. Students will work closely with industry participants and faculty to develop their analy sis as well as alternative strategies for the project at critical stages of its development.
Prerequisite: USP 523.

## USP 547 - Urbanization and Planning in the Global South (3)

Urban planning interventions in many cities in the Global South have been facing big challenges as rapid population growth has led to resource scarcity, environmental degradation, and social inequality. This course develops tools and ideas to understand is sues confronting cities in diverse socio-economic, political, and cultural circumstances, and how globalization impacts the local space of cities and regions. It focuses on challenges and opportunities in formulating appropriate planning interventions, and prepares planners to work in the diverse and rapidly changing contexts of the Global South.

## USP 548 -Public Transportation Planning and Policy

 (3)Public transit ridership and investments have been growing for the pasttwo decades as regions around the world grapple with worsening congestion, growing concerns about climate change, health, and social equity, and a reinvigoration of urban living and sustainable lifestyles. This course will introduce students to processes, policies and rules concerning the planning of public transit systems and the development of new transit investments, focusing mostly on buses and light rail.

## USP 549 - Regional Planning and Metropolitan Growth Management (3)

Explores regional planning in the U.S. today through an examination of historical and contemporary regional planning practice. Begins with an overview of the his tory of regional planning, including the evolution of thought regarding regionalismand the nature of regions. Examples of regional plans will be used as the basis for examining as sumptions, approaches, and methods serving as the foundation for regional planning practice. A synthesis of the findings of the review of plans will be used to draw general conclusions about the field and its prospects. Pays particular attention to the principles, approaches, and methods of growth management generally and with respect to metropolitan regions.

## USP 550 - Participatory Planning (3)

Examines the principles and methods for creating participatory planning. Demonstrates the linkage between frameworks and concepts such as collaborative planning,
deliberative democracy, equity planning, and the coproduction of plans and applied work. Considers various processes, techniques, and tools to foster equitable community engagement. Students design a participatory process forclients.

## USP 551 - Community Economic Development (3)

Course sets community economic development within the context of traditional state and local economic development policy and compares their underlying theoretical perspectives. It examines the impact of recent economic, social, and demographic transformations on local labor markets and surveys the labor-market problem solving activities of local governments and communitybased organizations. Business and commercial development strategies are als o explored.
Also offered for undergraduate-level credit as USP 451 and may be taken only once for credit.

## USP 552 - Urban Poverty in Critical Perspective (3)

Examines historical, empirical, and theoretical perspectives on urban poverty in the United States. It addresses the politics of poverty discourse by examining why explanations and policy prescriptions have emphasized morality and behavior; race, family, and culture; and dependency and responsibility rather than systemic economic inequality.

## USP 553 - Legal Processes in Urban Planning (1)

Covers the legalcontext within which land use planning and plan implementation takes place at the local level. Requirements for the conduct of hearings, appeals, and evidentiary processes are analyzed; skills for and techniques of writing findings and conditions of approval are developed; and questions of ordinance interpretation and liability are discussed.

## USP 554 - Planning and Housing Markets (3)

Explores the interaction of planning and local housing markets and submarkets. In a market economy, non-public actors build, own, and operate the majority of the housing stock (along with other assets, including other types of real estate, businesses, even ideas). Planning has a role in framing and influencing the decisions and approaches of these actors.

## USP 555 - Land Use: Legal Aspects (3)

Land use and planning fromthe legal perspective. Includes historical review of attitudes toward property tenure and ownership; the relationship between local planning and
regulations; and current is sues and perspectives on land use including emerging state and federal roles. Graduate students undertake a substantial independent project in addition to other requirements.
Also offered for undergraduate-level credit as USP 455 and may be taken only once for credit.

## USP 556 - Urban Transportation: Problems and Policies (3)

An introduction to urban transportation policy froma historical and political perspective. Historical developments in transportation policy are traced from the early streetcar days up through the present. Federal, state, and local transportation policies are examined for their impact on urban spatial and economic development. An overview of current issues in transportation policy and planning includes transportation demand management strategies, transit- oriented design, road pricing, and alternative transportation modes. The intersection of environmental and transportation policy is also examined, as is the decision-making structure at the local, regional, and state level.
Also offered for undergraduate-level credit as USP 456 and may be taken only once for credit.

## USP 557 - Information Cities (3)

Focuses on the political, social, and cultural impacts of mass media and information technologies within the urban matrix. Contextualizes the "information society" in historical, institutional, political, economic, and global settings. Topics include the flexible production, the segmentation of consumption, alternatives to mass media, the Web, the reorganization of work, the trans nationalization of culture, commercial and political surveillance, and the development of urban information infrastructure.
Also offered for undergraduate-level credit as USP 457 and may be taken only once for credit.

## USP 558 - Planning Workshop (3-6)

Organized teamapproach to a current planning problemin the Portland metropolitan area. Focus on planning practice, field investigation, data analysis, written and oral communication. Work programincludes strategies, methods, and skills needed to identify is sues and draw together all participants in the search for solutions. Emphas is is on the blending of practical skills with knowledge gained fromcore-area courses. Two-term sequence, credit for first term dependent upon successful completion of the second term.

## USP 559 - InternshipSeminar (1)

A 400-hour internship, or combination of internships, is required for completion of the MURP degree. This

Seminar serves as a means for graduatestudents admitted to the MURP deg ree programto share information regarding securing internships and the work products as sociated with internship experiences. An annual calendar for the seminar will be posted at the beginning of the year. Attendance at scheduled seminar meetings is required for all MURP candidates during the first two years of their enrollment in the program.

## USP 560 - Climate Resiliency Planning (3)

Aims to examine the res ponse of society to a changing climate, with an emphas is on the practices, processes, and programs that can improve the resiliency of communities to climate-induced impacts. We will investigate what it means to be "resilient", exploring principles from planning, sociology, engineering, environmental studies, and disaster studies, and other related fields. We will also pay special attention to the interplay between social inequality, poverty, social exclusion and vulnerability to natural disaster.
Cross-Listed as: This is the same course as EMCR 560 and may be taken only once for credit.

## USP 561 - Affordable Housing Development Workshop (5)

Students formteams to create a full proposal for an affordable housing development project, including funding, design, and resident services; when available students will enter project competitions. Two-term sequence, credit for first termdependent upon successful completion of the second term.

## USP 562 - Real Estate Development Workshop(3)

Students forma real estate development team and produce an original development plan, including the development concept, the market analysis, the conceptual design, economic analysis, capital and operations budget, and management plan. The student's plan will demons trate and apply mastery of the developmentconcepts and tools learned through the previous courses.
Prerequisite: USP 523 or instructor's consent. Course may be taken twice for credit with instructor's consent.

## USP 563 - Real Estate Construction (3)

Reviews the nature and characteristics of the reales tate construction process, including materials, costestimating procedures, budgets, schedules and legal procedures. Emphasis on the selection of building systems and review of the forms of construction contracts and associated documents commonly used in the industry. Reviews lessons learned fromcase studies.

Prerequisite: RE521.

## USP 564 - Political and Administrative Issues in Aging (3)

Coverage of organizational dynamics as related to the elderly including the provis ion and use of services. Covers voting behavior and advocacy as well as adminis trative and legal is sues that are particularly applicable to the elderly.

## USP 565 - Pedestrian and Bicycle Planning (3)

Examines the importance of walking and bicycling as means of transportation in a sustainable urban environment. Covers planning, design, implementation, and maintenance of bikeways and walkways, as well as ancillary facilities such as bicycle parking. Focus on the role of education, advocacy, and outreach in improving walking and bicycling conditions. Study relevant examples from various cities, with a heavy emphasis on Portland's experience.
Also offered for undergraduate-levelcredit as USP 465 and may be taken only once for credit.

## USP 566 - National Urban Policy (3)

Examination of the federal government's involvement with urban is sues froma historical and political perspective. Focus on policies pertaining to social welfare and economic development, with an overview of other policy arenas such as housing, health, andeducation. Critical analys is of how and why the federal government responds to urban crises with national policy initiatives and how changes in political regime correspond with changes in policy emphases and perspectives.

## USP 567 - Urban Housing Policies (3)

Review of the history and the role of public policy in the housing sector. Study of past and current trends in the delivery of housing services in urban areas. The basic philosophies related to the supply of housing are analyzed and examined relative to current trends in the delivery of housing services in urban areas. Critical review of the role of the federal government and the construction industry. Equal attention to the role of public housing and the impact of urban renewal. Active participation in discussion and a research paper are required.

## USP 568-Oregon Land Use Law (3)

The Oreg on programis placed in a national context that stres ses the broad nature of planning here. Structural relations between state, regional, and local government planning and regulation are analyzed. Legal as pects of the implementation of the various functional statewide planning goals are studied, as are the OregonLand Use

Board of Appeals and recent developments in local government land use planning and regulatory processes.

Also offered for undergraduate-level credit as USP 468 and may be taken only once for credit.

## USP 569 - Sustainable Cities and Regions (3)

This course explores the questions of whether and how cities can be sustainable -- and how they can continue as places that sustain cultures, economics, and nature. Basic technological and theoretical models of human-nature interaction will be considered, along with visionary possibilities for the future of cities and urban regions, globally and in Portland. Particular attention will be given to global-local interactions and to the strategies, programs, policies, and tools that can deliver sustainable and equitable development and advance environmental justice.

## USP 570 - Transportation and Land Use (3)

An analysis of transportation and land use interactions in urban areas. The impact of highway and transit changes on travel behavior, locational decisions, and urban formare examined. Recommended prerequisites: USP 515 and 544.

## USP 571 - Environmental Policy (3)

Surveys federal, state, and international environmental policy-making with an emphasis on process design. Political and technical objectives for policy, the roles and responsibilities of institutions, federal-s tate tensions, representation and analy sis of stakeholding interests, the role of the media, and environmental justice are key elements. Topical areas include is sues concerning res ource management as well as pollution prevention.

## USP 572 - Regional Economic Development (3)

This course focuses on methods of analyzing why regions differ economically, how they interrelate, and why and how they react to changes in economic policies and conditions. Part of the course will be devoted to a study of models of regional structure and growth, such as economic base or input-output, and the strengths and weaknesses of each in modeling the regional economy. The remainder of the course will be concerned with the development of models for use in regional forecasting and/orevaluation of policy changes on regional development. Recommended prerequisite: USP 515.

## USP 573 - Real Estate Economics (4)

Looks at the economics of real estate and housing, including land rent, interest rates, apartment rents, and housing prices, using an economic framework. Basic
concepts in urban economics such as agglomeration, trans portation costs and congestion, inequality and segregation, growth controls and sprawl, as well as amenities, externalities, and public goods are reviewed. Explores the technique mostcommonly used in realestate and housing economics: hedonic pricing. Explores the rationale and impact of government intervention in the private real estate market. Expected preparation: USP 515 or Fin 512.

Corequisite: Taking RE521 and USP 573 simultaneously is permitted. Cross-Listed as:This is the same course as RE 573 and may be taken only once for credit.

## USP 574 -Socio-Technical Change in the City (4)

At the core of the urban sustainability challenge is how societies build, maintain and reformsocio-technical systems-linking actors, institutions and values to the built and natural environment. Drawing fromscience and technology studies, this course analyzes socio-technical systems and the challenges to navig ating themalong more sustainable trajectories.

## USP 575 - Urban Design Workshop (4)

The workshop will explore the use of urban design as an integral part of the planning process through the creation of an urban design plan. Projects in the Portland region will be chosen to familiarize students with the practice of urban design planning and the products of the works hop will be presented to the public.
Also offered for undergraduate-level credit as USP 475 and may be taken only once for credit. . Prerequisite: Enrollment in good standing in the MARCH or MURP graduate degree programs or permis sion of the instructor.

## USP 576 -Feeding the City (4)

Introduction to historical and contemporary efforts to foster more just and sustainable urban food systems. Integrates critical social science perspectives, applied planning literature, case studies, and analysis of policy and planning best practices.

## USP 577 - Urban Environmental Management (3)

An accelerated survey of principles, concepts, and techniques employed in the management of urban environmental problems, with particularemphasis on "best practice" and emerging ideas. Selected topics may include: watershed stewardship, brownfield development, green spaces, protection of urban wildlife, stormwater management, urban agriculture, residential toxics.

## USP 578 - Impact Assessment (3)

Empirical techniques employed in measuring the impacts as sociated with land use change. Topics: goals achievement matrix approaches to impact as sessment, trade-offs between community and regional welfare, distance and time in urban analy sis, estimating the social profitability of land development, cost-benefit analy sis applied to freeway location, techniques for valuation of non-priced resources, measuring municipal revenue and expenditure impacts, gravity models and transport demand estimation, economic base analysis for employment and population impact assessment, estimating air and noise pollution as sociated with land development. Recommended prerequisite: USP 515.

## USP 579 - State and Local Public Finance (3)

The course will focus on the tax burdens, fiscal res ources, and expenditure patterns of local governments in metropolitan areas. The impact of revenue sharing and categorical grants will be discussed in relation to state and federal influence on local government finance. The spatial distribution of local government services, transfer payments, and tax burdens will be analyzed. Special attention will be paid to Oregon's complexproperty tax limitations.

Prerequisite: USP 515.

## USP 580 - Political Economy of Nonprofit Organizations (3)

Considers theories of altruism, trust, and social capital. Examines the connections between wealth and social responsibility and between elite status and social reproduction. Explores the broad scope of non profit activity in the economy, the interdependenceof government and nonprofit organizations in the modern state, and the role of think tanks in shaping public policy. Surveys the dramatic rise of non-governmental org anizations in developing countries and the future of nonprofits in a globaleconomy.
Also offered for undergraduate-level credit as USP 480 and may be taken only once forcredit.

## USP 581 - Environmental Psychology (3)

Examination of the relationship between people and their physical environments. Specific topics include human spatial behavior (pers onal space and territoriality), the contribution of the behavioral sciences to architectural and urban design, community and neighboring in the city, and environmental cognition.

## USP 582 -Sustainable Transportation (3)

This course covers the sustainability dimensions of transportation, considering his torical trends and future prospects. Topics covered in the course includeenergy use and alternative energy sources, technological change, traffic safety, vehicle emissions, environmental justice, the role of transportation in the economy, and the role of land use and urban design.
Prerequisite: graduate standing.

## USP 583 - Transportation Finance (3)

Much of the current funding for roads, transit, and freight comes fromfuel taxes; but increasing fuelefficiency of vehicles and the use of alternative energy sources raise questions about the long-termviability of this revenue source. This course will existing transportation fin ance and examine some of the proposals for alternative financing mechanisms.

## USP 584 - Negotiation in the Public Sector (4)

Overview of conventional and innovative applications of negotiations in public sector activities, and the potential and limitations of negotiation-based approaches to public decision making. Key components include negotiation theory, individual skill development, and a review of the institutional, legal, and political context of negotiations.

## USP 585 -Housing Environments for Older Adults (3)

Explores physical, social, and service contexts related to housing and environments for people across the age and ability spectrums, focusing on older adults. Ecological perspectives and social theories on aging will be examined and applied and students will examine evidence regarding how older adults use, perceive, and are affected by their homes and environments. Topics includehousing options, acces sible and inclusiveenvironments, supports and services, policies and politics, economics, neighborhood design, and age-friendly communities.
Also offered for undergraduate-level credit as USP 485 and may be taken only once for credit.

## USP 586 - Urban Social Networks (3)

Analysis of the socialps ychological and anthropological literature on social networks: the structure and content of interpers onal networks (including kinship, friendship, instrumental) in an urban setting. Specific topics will include: the nature of interpersonal ties in the city, urban migration and networks, access to urban res ources, methods of analyzing personal and group networks.

## USP 587 - Travel Demand Modeling (3)

Understand, analyze, and apply travel demand forecasting models from an applied and practical pers pective. The underlying theoretical basis of model components will also be covered. Student will become familiar with the traditional four-step travel forecasting process, including model application software package, and interpretation of model output. Involves hands-on use of transportation modeling software.
Prerequisite: an introductory course in urban transportation planning or professional experience in urban tran sportation planning; familiarity with spreadsheet software; collegelevel algebra; and introductory statistics (i.e., regres sion analys is). Prior experience with DOS is helpfulbut not mandatory.

## USP 588 -Sustainable Development Practices (3)

Introduction to analytic and management approaches intended to limit the social and environmental harms as sociated with most past patterns of development. Builds upon basic understanding of socio-environmental change and provides a foundation for subsequent indepth studies of particular sustainable development strategies and analytic techniques. Students study a broader range of sustainable development topics, tools, and techniques.

## USP 589 - Theorizing Urban Natures (4)

This seminarexamines various ways of understanding urban "nature". Students will contrast dominant ecological frameworks with those used in the social sciences (e.g., urban politicalecology, actor-network theory), with attention to the social, political, and economic contexts in which they arose, and implications of each for research, practice, and politics.

## USP 590 - Green Economics and Sustainable Development (3)

Examines prevailing as sumptions about economic growth, production, consumption, labor, and leisure. Considers how changes in these basic as sumptions might help us design an economic systemthat includes alternative values such as appropriate scale, community impact and environmental sustainability.
Also offered for undergraduate-level credit as USP 490 and may be taken only once for credit.

## USP 591 - Geographic Information Systems I: Introduction (4)

The use of computers in Geographic Information Systems (GIS) and mapping. Includes theory of databases related to geographic information management and practical aspects of database design. Students willuse a variety of programs
for mapping and spatial analysis of geographic information. Each student completes a series of exercises demonstrating a variety of approaches to the analysis and display of spatial data. Students enrolling in this class must register for a computer lab section. This is the same course as Geog 588 and may be taken only once forcredit.
Expected preparation: Geog 380 or equivalent experience in cartography.
Corequisite: Geog 588L. Cross-Listed as: Geog 588.

## USP 592 - Geographic Information Systems II: Applications (4)

Analysis and applications of geographic information systems concepts and technology to land planning and management is sues. The multipurpose land information systems concept is used as an organizing device for spatial regis tration of data layers to achieve data sharing and compatibility among functions. Userneeds assessment and systems design provides the basis for systems procurement, implementation, and use. Expected preparation: Geog 488/588 or USP 591. Students enrolling in this class must register for a computer lab section. This is the same course as Geog 592 and may be taken only once for credit.

Corequisite: Geog 592L. Cross-Listed as: Geog 592.

## USP 593 - Public Participation GIS (3)

Offered as a studio-based GIS class. The objective is for students to apply GIS skills acquired in previous GIS courses to a specific real-world spatial problem. Tasks will involve problemdefinition, primary data collection, advanced GIS analys is, and presentation of results. This format will give students practical experience in implementing GIS technologies with specific emphasis on planning problems. Students will be required to work in small groups in a simulated professional planning practice environment. Expected preparation: USP 531 and USP 543 or USP 591 and USP 592.

Also offered for undergraduate-level credit as USP 493 and may be taken only once for credit. .

## USP 594 - Planning in the Pacific Northwest (3)

This course will utilize the work of Pacific Northwest historians, writers, critics, and others as a vehicle for equipping planners with a some what systematic and certainly eclectic cultural overview of the region they hope to serve. This course will attempt to prepare them to be members of a place and of a culture of place, and to embrace the art and literature of the Pacific Northwest as part of their ongoing professional development. Though focused on the Pacific North west, the general approach used in this course should be applicable to other regions as well.

## USP 595 - Reshaping the Metropolis (3)

Examination of the contrast between classic models of metropolitan settlement and new patterns emerging in the late twentieth century. Land use changes in the context of new patterns of economic activity; ideas about the physical form of the goodcity and the societal implications of development patterns; is sues of res idential choice, community change, globalization, and environmental protection as affected by metropolitan growth.

## USP 596 - Affordable Housing Finance (3)

Introduction to the uniquechallenges of financing and developing affordable housing projects. The challenges and tools forfinancing rental as well as owner-occupied housing will be covered, and case studies will be used to illus trate the ways in which financing for affordable housing is created and used, and poses unique challenges for investors, juris dictions, and community-based groups. Expected preparation: USP 312.

Als o offered for undergraduate-level credit as USP 496 and may be taken only once forcredit. .

## USP 597 - Regional Economic Analysis (2)

Reviews analytical tools and datasources and provides hands on training for applying themto questions about regionaleconomies. Includes demographic analysis, regional business structure, analyzing regional economic change, labor market analysis, researching firms, and conducting cluster analysis and economic opportunities analys is. Expected preparation: basic statistics.

## USP 598 - Project Management for Planners (1)

Project management is the practice of deploying resources, developing schedules and analyzing risks to produce a desired outcome. In this class we will use hands-on case studies to explore the dimensions of project management and build skills for projects typical to urban planning in scope and scale. The course will also address strategies for building leadership and communication skills and promoting equity and inclusion in project development, client engagement and teammanagement.

## USP 601 - Research (0-9)

(Credit to be arranged.)

USP 602 - Independent Study (1-9)
(Credit to be arranged.)

## USP 603 -Dissertation (0-15)

(Credit to be arranged.)

## USP 604-Cooperative Education/Internship (1-9)

(Credit to be arranged.)

## USP 605 - Reading and Conference (0-9)

(Credit to be arranged.)

## USP 606 - Project (1-9)

(Credit to be arranged.)

## USP 607 -Seminar (1-9)

(Credit to be arranged.)

## USP 609-Practicum(1-9)

(Credit to be arranged.)

## USP 610 -Selected Topics (0-9)

(Credit to be arranged.)

## USP 612 - Community, Planning, and Ethics (4)

Introduction to the his tory and theory of community development in North America, thetheory and practice of urban planning in North America, and to theethics of civic and business practices linking the public, private, and nonprofit sectors. It examines the tensions among marketbased development, community action, and public intervention. Topics range in scale fromhousing style choices to aggregate trends in metropolitan formand cover a wide range of actors including individual households, private builders and developers, reformers, nonprofit organizations, and governments. The course will focus on plans as theoutcome of political processes with specific consequences fordifferent constituencies within the city.

## USP 613 - Urban Economic and Spatial Structure (3)

Provides an introduction to the economic and spatial aspects relevant to the field of urban studies. Provides an overview of existing theories and empirical evidence relating to urban spatial and economic relationships. Examines the impact of federal, state, and local government policies, and changing economic conditions on these relationships.

## USP 614 - History and Theory of Urban Studies (3)

Leading thinkers and milestones in the analysis of urban development and urban life. Complementary theories and models of the social sciences. Postmodern approaches. Visionary and critical res ponses to the possibilities of metropolitan life.

## USP 615 - Economic Analysis of Public Policy (4)

Introduction to the use of microeconomic analysis in the evaluation of public policy. Intended forentering graduate students with a limited background in economics. Develops basic analytic methods andemphasizes application of the analy sis to is sues of public policy. Prepares students for adv anced classes that use this type of analys is.

## USP 616 - Cities in the Global Political Economy (3)

Introduction to political theory and the political economy of globalization. Begins with core political ideas from classical works of political economy (Locke, Rousseau, Smith, Mills, Marx, Marshall, Keynes, Friedman, and Rawls) and proceeds to an analysis of the rise of transnationalismand globalization. Looks at changes in the globaleconomy, revolutionary changes to capitalism, the fall of communism, and impacts of globalization on cities, communities, the state, work, social mobility, welfare, cultural diversity, and the environment.

## USP 617 - The Sociology and Politics of Urban Life (3)

A survey of important theories of and empirical research about the social structure and political dynamics of urban areas. The impacts of globalization on urb an social and political life, the changing nature of community and social relations within cities and suburbs, and evolving patterns of intergovernmental cooperation and conflict within metropolitan regions will be analyzed.

## USP 619 - Development Partnerships (3)

Considers public and private partnerships to develop real estate in terms of the benefits to the wider urban community and policy goals such as affordable housing, community redevelopmentto economic development, and sustainability. The course looks at how public and private organizations can meet policy goals, createeconomic returns, and mitigate risk. Expected preparation: USP 523.

## USP 624 -Development Project Design (3)

Provides an understanding of architectural practice, the value added by design, the intersection of design with broader community concerns and developer's objectives, and the management of the design process, including tools for decision analysis in all phases of the building design process. A primer on building systems and engineering and case studies of the major building types will be presented. Expected preparation: USP 523.

## USP 625 - Green Buildings II (3)

Applies green building concepts to advanced real es tate problems, including the rehabilitation and adaptive reuse of existing real estate properties. Properties being covered include retail, office, hotel, industrial, and residential properties. The class will examine techniques for increas ing density, recycling materials, improving energy efficiency, and creating healthy work and living environments. The course will look at property management and portfolio management froma green building perspective.
Prerequisite: USP 529.

## USP 630 - Research Design (4)

Principles of research design, including philosophical bases of scientific research, approaches to research, problemidentification, problemstatement, development of research questions, development of research hypotheses, and the relationship of research hypotheses to modes of data gathering and analysis. The laboratory (530L) must be taken concurrently. Recommended prerequisite: USP 430.
Corequisite: USP 630L.

## USP 630L - Res earch Design Lab (0)

Research design lab.
Corequisite: USP 630.

## USP 634 - Data Analysis I(4)

Application of multivariate statistical analysis in an urban context. Emphasis on applications of various techniques within the general linear model. Recommended prerequisite: USP 532. The laboratory (USP 534L) must be taken concurrently. Recommended prerequisite: USP 430.

Corequisite: USP 634L.

## USP 634L - Data Analysis Lab (0)

Data analys is lab.
Corequis ite: USP 634.

## USP 636 -Political and Economic Decision-making (3)

Examines the philosophical and conceptual assumptions embodied in alternative decision-making theories in the
fields of economics and politics. Designed to show students thedifferences in individual and collective decis ion-making processes and the technical and social challenges faced in decision-making processes in the market place and the realm of politics. Examples cover local, national, and international policy topics. This is the same course as PS 559 and may be taken for credit only once. Recommended prerequisite: USP 515/615.
Cross-Listed as: PS 559.

## USP 654 - Data Analysis II (4)

Takes an applied approach to statistical analysis and research methodology and is the second in a two-course sequence. Provides students with statistical background, conceptual understanding, technical writing skills, computer application, and the ability to apply these skills to realistic data analysis problems and research designs. Topics include simple regression and correlation, multiple regression, and logistic regression. The laboratory (USP 654 L ) must be taken concurrently. Recommended prerequisites: USP 634 or an equivalent course approved the instructor and prior experience with statistical software.
Corequisite: USP 654L.
USP 654L - Data Analysis II Lab (0)
Data analys is lab.
Corequisite: USP 654.

## USP 655 - Advanced Data Analysis: Structural Equation Modeling (3)

Introduces students to structural equation modeling, a regression-based technique that incorporates elements of path analysis and confirmatory factor analysis. Topics covered include path analysis, confirmatory factor analysis, and structural models with cross-sectional, longitudinal, and multiple groups. The general goal is to provide a thorough background in the conceptual aspects, statistical underpinnings, and application of this method.

## USP 657 - Advanced Data Analysis: Discrete Choice Modeling (3)

Presents the theory and practice underlying the formulation and estimation of models of individual dis crete choice behavior with applications to travel, travel related and other choices. Provides students with an understanding of the theory, methods, application and interpretation of multinomial logit (MNL), nested logit and other members of the Generalized Extreme Value (GEV) family of models, as well as an introduction to mixed logit models.
Prerequisite: USP 634 or equivalent intermediate statistics/econometrics course.

## USP 660 - Policy Process (3)

Focuses on the politics of the policy process. It examines the role, influence and interaction of legis latures, executives, bureaucracies, courts, policy communities and citizens. Follows the stages of policy development: problemdefinition, agenda setting, budgeting, authorization, implementation and oversight. Case material is taken from federal, state, and local governments with special consideration given to the intergovernmental aspects of the policy process.

## USP 663 - ProgramEvaluation (3)

This course is designed as a graduate introduction to the field of evaluation research and programevaluation. Topics covered include contemporary and emerging theoretical pers pectives on evaluation research, experimental and quasi-experimental design, internal and external validity and reliability, measurement, analysis of change, ethical is sues in evaluation, adminis tration of programevaluation.

## USP 674 -Spatial Analysis (3)

The use of geographically coded datato identify and anticipate future patterns of human activity in metropolitan areas and systems of cities. Emphasizes techniques to establish whether the characteristic landscapes associated with static and dy namic models of behavior are present. Diffusion processes, expanded location theories, and models of decision making fromspatially arrayed cues receive particular attention. Recommended prerequis ite: USP 532.

## USP 676 - Activity Location (3)

The location of human activities in urban systems. Location of economic activities where profit maximization is desired, and location decisions with equity maxima.

## USP 679 - Metropolitan Fiscal Structure (3)

The course will focus on the following topics: the tax burdens, fiscal res ources and expenditure patterns of local governments in metropolitan areas. The impact of revenue sharing and categorical grants. The spatial distribution of local government services, transfer payments, and tax burdens. Review of literature on the urban-suburban exploitation thesis, the Tiebout-Oates model, etc.
Prerequisite: USP 515.

## USP 682 -Sustainable Transportation (3)

This course covers the sustainability dimensions of transportation, considering his torical trends and future
prospects. Topics covered in the course include energy use and alternative energy sources, technological change, traffic safety, vehicle emis sions, environmental justice, the role of transportation in the economy, and the role of land use and urban design.

Prerequisite: graduate standing.

## USP 683 - Qualitative Analysis (4)

Study of a variety of qualitative methods of analyzing socialscience problems, with an emphasis on applications to urban studies. Students study the philosophy of academic inquiry, understanding and interpretation of socialaction. Specific techniques include content analysis, participant observation, field observation, ethnography, interviewing, and focus groups, among others.
Organization, coding, and analysis of qualitative data. Expected preparation: USP 630.

## USP 689 - Advanced Urban Politics and Sociology (3)

This is an advanced readings seminar focusing on the literature and emerging theoretical and methodological debates in the fields of urban sociology and political science. This course is intended as an intensive seminar for graduate students seeking both greater familiarity and involvement with the literature and discourse in these fields.
Prerequisite: USP 517/617.

## USP 697 - Res earch Design 2 (4)

Research seminar required for students in urban studies doctoral program; open to MUS and other adv anced graduate students. Students apply their substantive background and methodological training to develop all the components of a social science research paper:statement of focused research question, literature review, development of hypotheses, definition of appropriate methodology, design of data acquisition, and pilot testing of data acquisition strategy. Expected preparation: USP 614, USP 613, and USP 617.

## Viet-Vietnamese

## Viet 101 - First-Year Vietnamese Term 1 (4)

Elementary work in the Vietnamese language with emphas is on listening comprehension, speaking, grammatical patterns, reading, and writing. Includes discussions of Vietnamese culture and traditions. Suitable for beginners and Vietnamese speakers with limited ability. This is the first course in a sequence of three: Viet 101, Viet 102, and Viet 103.

## Viet 102 - First-Year Vietnamese Term 2 (4)

Elementary work in the Vietnamese language with emphasis on listening comprehension, speaking, grammatical patterns, reading, and writing. Includes discussions of Vietnamese culture and traditions. Suitable for beginners and Vietnamese speakers with limited ability. This is the second course in a sequence of three: Viet 101, Viet 102, and Viet 103.

## Viet 103 - First-Year Vietnamese Term 3 (4)

Elementary work in the Vietnamese language with emphasis on listening comprehension, speaking, grammatical patterns, reading, and writing. Includes discussions of Vietnamese culture and traditions. Suitable for beginners and Vietnamese speakers with limited ability. This is the third course in a sequence of three: Viet 101, Viet 102, and Viet 103.

## Viet 201 -Second-Year Vietnamese Term 1 (4)

Work in the Vietnamese language focusing on various cultural aspects of Vietnamese life. The language skills include speaking, listening, reading and writing. Resources and information fundamental to the Vietnamese heritage will be discussed. This is the first course in a sequenceof three: Viet 201, Viet 202, and Viet 203.

## Viet 202 -Second-Year Vietnamese Term 2 (4)

Work in the Vietnamese language focusing on various cultural aspects of Vietnames elife. The language skills include speaking, listening, reading and writing. Resources and information fundamental to the Vietnamese heritage will be discussed. This is the second course in a sequence of three: Viet 201, Viet 202, and Viet 203.

## Viet 203 -Second-Year Vietnamese Term3 (4)

Work in the Vietnamese language focusing on various cultural aspects of Vietnames elife. The language skills include speaking, listening, reading and writing. Res ources and information fundamental to the Vietnamese heritage will be discussed. This is the third course in a sequence of three: Viet 201, Viet 202, and Viet 203.

## WLL - World Languages \& Literature

## WLL 101 -Special Studies (1-4)

(Credit to be arranged.)

## WLL 102 - First-year World Languages (1-4)

Contact the department for information on this course.

## WLL 103 - First-year World Languages (1-4)

Contact the department for information on this course.

## WLL 199 - Special Studies (1-8)

(Credit to be arranged.)

## WLL 201 -Special Studies (1-4)

(Credit to be arranged.)

## WLL 202 -Second-year WorldLanguages (1-4)

Contact the department for information on this course.

## WLL 203 -Second-year WorldLanguages (1-4)

Contact the department for information on this course.

## WLL 299 - Special Studies (1-6)

(Credit to be arranged.)

## WLL 319U - Fairy Tales and Folklore (4)

A study of the fairy tale, folklore and/or other works originating orally representing a range of critical social and cultural issues. May be repeated with differenttopics. Course taught in English.

## WLL 335U - The Icelandic Sagas (4)

Explores the sagas and the cultural milieu in which they were created. Conducted in English. Expected preparation: Sophomore Inquiry.

## WLL 349 - Forbidden Love (4)

Study of depictions in literary works of gender and sexual identity, orientation, or practice that differs fromthat of the majority of the surrounding society. Works will be drawn from world literatures in translation. Course may be repeated with different topics. Course conducted in English.

## WLL 361 U- Bestsellers andBlockbusters (4)

Study of the interplay between literary works froma variety of time periods and their cinematic representations. Students will develop analytical and critical thinking skills applicable both to the page and the screen. May be repeated with different topics. Course taught in English.

## WLL 371 -Global Citizenshipin Professional Contexts

 (4)Designed for students who are interested in developing a betterunderstanding of today's global issues and ascertaining possible strategies to be functional in a global setting. Through hands-on projects, students will develop strategies to help thembreak down cultural barriers, challenge stereotypes, appreciate differences and converge commonalities in people, cultures, and communities.

## WLL 380 - Introduction to Comparative Literary and Cultural Studies (4)

Overview of the practices, methods, and materials of comparative literary and cultural studies, with an emphasis on learning specific modes of encountering creative expression fromdifferent linguistic, cultural, and national backgrounds. Introduces students to major questions, concepts, and debates in the field as well as literary works in relation to various themes, ideas, genres, and contexts.
Prerequisite: Upper-division standing. Cross-Listed as: This is the same course as Eng 380 and may be taken only once forcredit.

## WLL 381 - Topics in Translation Studies (4)

Students will develop analytical frameworks to understand trans lation and its implications for textual interpretation. Students work with case studies that highlight the role of translation throughout history; they also examine how methods fromTranslation Studies enrich the study of literary and non-literary texts alike. Those with secondlanguage competency can optionally develop skills to producetranslations of their own. This course may be repeated forup to 8 credits.
Cross-Listed as: This is the same course as Eng 381.

## WLL 383U - Topics in Comparative Literature, Film and Comics (4)

Students learn how to compare literary, film, or comicbook genres across two or more world cultures; readings (viewings) of texts/films are followed by discussion of cultural differences. Students also learn how to discuss genre differences and how cultural attitudes shape those different artistic res ponses and appropriations of global artistic ideas. Analysis of critical texts reveal how cultural attitudes create different expectations or requirements for
genres. Readings and discussions are in English. This course may be repeated for up to 8 credits.

Cross-Listed as: This is the same course as Eng 383U.

## WLL 390 - Languages of the World (4)

Overview of the world's languages and language families.
Presentation of specific languages, basic phonemic and structural analyses to illus trate linguis tic terms and concepts.

## WLL 399 -Special Studies (1-12)

(Credit to be arranged.)

## WLL 403 - Thesis (1-9)

(Credit to be arranged.)

## WLL 404-Cooperative Education (1-12)

(Credit to be arranged.)

## WLL 405 - Reading and Conference (1-12)

(Credit to be arranged.)

## WLL 408 - Workshop(1-12)

(Credit to be arranged.)

## WLL 409 - Practicum(1-12)

(Credit to be arranged.)

## WLL 410 -SelectedStudies (1-12)

(Credit to be arranged.)

## WLL 438 - Language and Technology (4)

Examination of the communicative dynamics, cultures, and educational possibilities of digital environments as they are used in social, professional and world languageeducation settings. Students will analyze and as sess a variety of online environments for their own language learning or can choose to focus on research or pedag ogical projects.
Also offered for graduate-level credit as WLL538 and may be taken only once for credit. . Prerequisite: Upperdivision standing.

## WLL 448U- Major Figures in World Literature (4)

Concentrated study of the canon of one or more major writers: for example, Dostoevsky, Cervantes, Goethe. Recommended prerequis ite: Sophomore Inquiry or 12 credits of literature. Conducted in English.

## WLL 449 - Major Topics in World Literature and Culture (4)

Study of the treatment of topics in one or more of the cultures of the world. Such topics as Europe as self and other, Don Juan, exile, the quest, outlaws and bandits, ghosts, fairies and gods. Expected preparation: Sophomore Inquiry or 12 credits of literature. Conducted in English.
Also offered for graduate-level credit as WLL547 and may be taken only once for credit. .

## WLL 493 -Language Proficiency Testing and Teaching

 (4)Application of proficiency standards in tes ting and teaching at the novice and intermediate levels. Introduction to ILR/ACTFL/ETS/FSI guidelines and compatible testing methods. Discussion of pragmatic issues: testing technique and test validity; useof teaching materials; logistics. Expected preparation: three years of a foreign language. Conducted in English.

Also offered for graduate-level credit as WLL593 and may be taken only once for credit. .

## WLL 498 - Methods of Teaching Foreign Languages (4)

Study and analysis of various pedagogical theories as applied to the learning and teaching of foreign languages. Specialemphasis on discourse and content analysis. Recommended for prospective language teachers. Expected preparation: three years of a foreign language. Conducted in English.
Also offered for graduate-level credit as WLL598 and may be taken only once for credit. .

## WLL 501 - Research (1-9)

(Credit to be arranged.)

## WLL 504 -Cooperative Education (1-12)

(Credit to be arranged.)

## WLL 505 - Reading and Conference (1-12)

(Credit to be arranged.)

## WLL 508 - Workshop(1-12)

(Credit to be arranged.)

## WLL 509 - Practicum(1-12)

(Credit to be arranged.)

## WLL 510 -SelectedStudies (1-12)

(Credit to be arranged.)

## WLL 538 - Language and Technology (4)

Examination of the communicative dynamics, cultures, and educational possibilities of digital environments as they are used in social, professional and world languageeducation settings. Students will analyze and assess a variety of online environments for their own language learning or can choose to focus on research or pedagogical projects.
Also offered for undergraduate-level credit as WLL438 and may be taken only once for credit. .

## WLL 549 - Major Topics in World Literature and Culture (4)

Study of the treatment of topics in one or more of the cultures of the world. Such topics as Europe as self and other, Don Juan, exile, the quest, outlaws and bandits, ghosts, fairies and gods. Expected preparation: Sophomore Inquiry or 12 credits of literature. Conducted in English.
Also offered for undergraduate-level credit as WLL447 and may be taken only once for credit. .

## WLL 560 - Principles of Scholarly Research (4)

A theoretical and practical introduction to research methods and literary theory. Investigation of bibliographic materials, primary texts, secondary literature, and major forms of literary criticis $m$. To be taken in first year of graduate study.

## WLL 593 - Language Proficiency Testing and Teaching

 (4)Application of proficiency standards in testing and teaching at the novice and intermediate levels. Introduction to ILR/ACTFL/ETS/FSI guidelines and compatible testing methods. Discussion of pragmatic is sues: testing technique and test validity; useof teaching materials; logistics.
Expected preparation: threeyears of a foreign language. Conducted in English.

Also offered for undergraduate-level credit as WLL493 and may be taken only once for credit. .

## WLL 598 - Methods of Teaching Foreign Languages (4)

Study and analysis of various pedagogical theories as applied to the learning and teaching of foreign languages. Specialemphasis on discourse and content analysis. Recommended for prospective language teachers. Expected preparation: three years of a foreign language. Conducted in English.
Also offered for undergraduate-levelcredit as WLL498 and may be taken only once for credit. .

## Wr - Writing

## Wr 115 - Introduction to College Writing (4)

Study and practice of college-level writing and reading, with focus on developing strategies for academic writing. Designed for students wanting preparation for WR 121 or Freshman Inquiry.

## Wr 121 - College Writing (4)

Study and practice of critical writing, with focus on analyzing and adapting to different contexts. Designed as a foundation for college-level writing.

## Wr 199 - Special Studies (1-4)

May be repeated for a maximum of 12 credits. See department for course description. (Credit to be arranged.)

## Wr 200 - Writing About Literature (4)

Introduction to various approaches to writing about literature, with focus on explication, analysis, and research.

## Wr 210 - Grammar Refresher (2)

Practical review of Standard Academic English, including parts of speech, sentence construction, and punctuation, with focus on self-evaluation and editing.

## Wr 211 - Writing Practice (4)

Pursuit of advanced writing projects, with focus on writing processes, editorial response, and revision.

## Wr 212 - Introductory Fiction Writing (4)

Introduces the beginning fiction writer to bas ic techniques of developing character, point of view, plot, and story idea in fiction. Includes dis cussion of student work. May be repeated for a total of 8 credits. Expected preparation: Freshman Inquiry.

## Wr 213 - Introductory Poetry Writing (4)

Introduces the beginning writer of poetry to basic techniques for developing a sense of language, meter, sound, imagery, and structure. Includes discussion of professional examples and student work. May be repeated for a total of 8 credits. Expected preparation:Freshman Inquiry.

## Wr 214 - Introductory Nonfiction Writing (4)

An introduction to writing with the major forms and techniques of literary nonfiction. Beginning with exercises in foundational skills such as description, reportage and the crafting of pers onal narrative, students will write and respond to short works of creative nonfiction. May be repeated for a total of 8 credits. Expected preparation: Freshman Inquiry or equivalent.

## Wr 222 - Writing Res earch Papers (4)

Introduction to academic inquiry, with focus on evaluating and engaging with secondary research and on conventions for documentation.

## Wr 227 - Introductory Technical Writing (4)

Practical experience in forms of technical communication, emphasizing basic org anization and presentation of technical information. Focuses on strategies for analyzing the audience and its information needs. Recommended: Wr 121 or Freshman Inquiry.

## Wr 228-Media Writing (4)

An introductory course in media reporting and writing. Focus on identifying newsworthiness, writing leads, constructing news stories, interviewing, and attributing quotes. Students learn to gather local news, writing some stories in a computer lab on deadline. Expected preparation: Wr 121 or Freshman Inquiry. May be repeated once for a total of 8 credits.

## Wr 299 - Special Studies (1-4)

(Credit to be arranged.)

## Wr 300 - Topics in Rhetoric and Composition (4)

Study and practice of writing in different rhetorical contexts, with focus on critical analy sis, generic conventions, and writing processes. Course may be
repeated for credit with different topics for up to 8 credits. Up to 8 credits of this course number can be applied to the English major.

## Wr 301 - Critical Writing in English (4)

This writing-intensive course extends the skills developed in Eng 300 by studying some selected theoretical and disciplinary approaches to literary and other texts (including literary and rhetorical theory), and by introducing students to research methods as a way of entering scholarly conversations.

## Wr 312 - Intermediate Fiction Writing (4)

Builds on fictional techniques introduced in Wr212, including variations on the classic plot, complexpoints of view, and conventions of genre. Emphasizes discussion of student work. May be repeated once for credit.
Prerequisite: B or higher in Wr 212, or consent of instructor based on a writing sample.

## Wr 313 - Intermediate Poetry Writing (4)

Continues the study of poetry writing techniques introduced in Wr213. Includes additional instruction in poetic forms, variations on traditional forms, and experimental forms. Emphasizes discussion of student work. May be repeated once for credit.
Prerequisite: B or above in Wr213 or consent of instructor based on a writing sample.

## Wr 323 - Writing as Critical Inquiry (4)

Study and practice of writing and research in various contexts, with focus on pursuing critical questions and crafting rhetorical dis course.

## Wr 327 - Technical Report Writing (4)

Prepares students for writing as professionals in engineering, scientific and other technical disciplines. Topics covered include technical and workplace genres of writing, such as proposals and reports, oral presentations, writing about and with data, effective language practices, writing collaboratively, and ethics.

## Wr 328 - Media Editing (4)

Preparation of news and feature stories for publication. Emphas is is on line editing, copy editing, editorial troubleshooting, headline writing, layout, and integration with multimedia.
Prerequisite: Wr 228.

## Wr 330 - Desk top Publishing I (4)

Integrates writing, design, and visual communication with computer technology, with emphasis on preparing students to produce a variety of shorter products combining writing and design elements.

## Wr 331 - Book Publishing for Writers (4)

Provides an overview of the book publishing process for writers who would like to publish their own writing, either through traditional publis hing processes or alternative routes such as self-publishing. Students will write query letters, create marketing plans, and provide peer editorial feedback as they learn more about editing, design, production, marketing, distribution, and sales.

## Wr 333 - Advanced Essay Writing (4)

Study and practice of the essay genre across creative and critical contexts.

## Wr 394 - Careers for English Majors (4)

Exploration of potential career paths for English majors, including (but not limited to) writing, editing, and teaching in various contexts. Students will participate in professional development activities according to their interests.

## Wr 398 - Topics: Writing Comics (4)

Study and practice of creating comics and graphic narratives in a variety of genres, with a focus on formand process. Course may be repeated for credit with different topics for up to 8 credits. Up to 8 credits of this course numbercan be applied to the English major.

## Wr 399 -Special Studies (1-5)

See department for course description. (Credit to be arranged.)

## Wr 400 - Advanced Topics in Composition (4)

Advanced study of writing theory and practice, with focus on rhetoric, genre, and process. Course may be repeated for credit with different topics for up to 8 credits. Up to 8 credits of this course number can be applied to the English major.

Also offered for graduate-levelcredit as Wr 500. Prerequisite: Upper-division standing.

## Wr 402 - Independent Study (1-12)

(Credit to be arranged.)

## Wr 403 - Thesis (1-12) <br> (credit to be arranged.)

## Wr 404 - Cooperative Education/Internship (1-12)

See department for course description. (Credit to be arranged.)

## Wr 405 - Writing and Conference (1-6)

Consent of instructor. See department for course description. (Credit to be arranged.)

## Wr 407 - Writing Seminar (1-6)

Consent of instructor. See department for course description. (Credit to be arranged.)

## Wr 410 -SelectedTopics in Writing (0-6)

See department for course description. (Credit to be arranged.)

## Wr 411 - Internship (1-4)

Students apply their academic training and skills in the workforce, further developing those skills and learning new skills in the process. Students develop a better understanding of the value to employers of their education in literature, writing, and/or publishing. Integrating an internship with reflection and professional development enhances theexperience.

Also offered for graduate-level credit as Wr 511.
Prerequisite: Permis sion of instructor.

## Wr 412 - Advanced Fiction Writing (4)

Students can expect to write longer and more ambitious works of fiction, while exploring a variety of technical problems and other questions emerging fromclass discussion. Course may be repeated once for credit.
Prerequisite: "B" or higher in Wr 312, or consent of instructor based on a writing sample.

## Wr 413 - Advanced Poetry Writing (4)

Students can expect to explore a variety of demanding technical problems and to experiment with poetic voices. Course may be repeated once forcredit.

Prerequisite: "B" or higher in Wr313, or consent of instructor based on a writing sample.

## Wr 416 -Screenwriting (4)

Students will be introduced to the process of conceiving, structuring, writing, rewriting, and marketing a screenplay for the contemporary American marketplace. "Screenplay paradigms" will be discussed, and a variety of movies will be analyzed. May be repeated for credit.
Also offered for graduate-level credit as Wr 516.
Wr 420 - Writing Studio (4)
Pursuit of advanced writing projects, with focus on process, response, reflection, and revision. Course may be repeated forcredit with different topics. Up to 8 credits of this course numbercan be applied to the English major.

Also offered for graduate-level credit as Wr 520. . Prerequisite: Upper-division standing.

## Wr 424 - Grant Writing for Professional Writers (4)

Introduces students training for careers as professional writers to the best practices in writing grants and managing the grant writing process across multiple sectors of the non-profit world and in academia. Students will work collaboratively and individually to develop business plans, identify potential funding sources, and begin preparing grants.
Also offered for graduate-level credit as Wr 524 and may be taken only once for credit. Prerequisite: Upper-division standing.

## Wr 425 - Advanced Technical Writing ()

Study and practice of foundational ways of thinking and professional skills for students planning to pursue a role or a career as a technical writer across a variety of industries and disciplines, including technology, health, engineering, science, manufacturing, and non-profits. Course topics include audience analysis, writing and editing in plain language for diverse audiences, common genres, ethics, collaborative writing, and project management. Students author individual and collaborative projects for a pers onal or programprofessional portfolio.
Also offered for graduate-level credit as Wr 525 and may be taken only once for credit. Prerequisite: Upper-division standing.

## Wr 426 - Document Design (4)

Document planning, creation, and revision, including discussion of the use and abuse of language in business, government, insurance, and law. Students will consider general strategies for document production; analyze different document styles; address questions of target audience; evaluate documents for readability and efficiency; and study thePlain English Movement and its legislative and legalimplications.

Also offered for graduate-level credit as Wr 526 and may be taken only oncefor credit.

## Wr 427 - Technical Editing (4)

Gives technical writers practice in technical editing by exposing themto samples of a variety of documents from the files of org anizations in the surrounding community. As a community based learning course, it requires students to interact with community partners in collaborative student teams. May be repeated for a maximum of 8 credits.

Also offered for graduate-level credit as Wr 527.

## Wr 428 - Advanced Media Writing (4)

Building on the journalis mskills learned in Media Writing and Media Editing, students use Portland to cover and write stories fromcommunity sources. Students are also introduced to reporting on a regular basis fromnews beats of their choosing. Expected preparation: Wr 328.
Also offered for graduate-level credit as Wr 528 and may be taken only onceforcredit. . Prerequisite: Wr 228.

## Wr 429 - Writing Computer Documentation (4)

Develop skills in writing computer documentation, primarily user manuals and systems pecifications. Focuses on analyzing informational needs of the audience, and defining and explaining computer terms and concepts for non-technical and semi-technical audiences. Expected preparation: Wr327, ISQA 111 or CS 105 or equivalent, word processing skills.

Also offered for graduate-level credit as Wr 529 and may be taken only once for credit. .

## Wr 430 - Desktop Publishing II (4)

Builds from the foundation in Desktop Publishing I to explore further the skills needed to produce publications in the computer age. Topics include typography, page layout, photography, and informational graphics, with a special emphasis on hands-on project production of a 12-page newsletter or magazine.
Also offered for graduate-level credit as Wr 530 and may be taken only once for credit.

## Wr 431 - Advanced Topics in Technical Writing Technologies (4)

An introduction to a contemporary technology used by technical writers in industry. Students will producea portfolio project to demonstrate proficiency in the technology. Students will also learn general strategies for learning new technologies as part of a profes sional practice. This course is repeatable for up to 16 credits.
Also offered for graduate-level credit as Wr 531. Prerequisite: Upper-division standing.

## Wr 432 - Frameworks for Technical Writing (4)

Introduces students to the many frameworks for understanding the fundamental questions that shape technical writing as a practice in industry and as a field of academic study, such as rhetoric, ethics, or social justice. Students will choose a framework to analyze and respond to a technical writing problemor situation of their choice and produce a portfolio to share findings.
Also offered for graduate-level credit as Wr 532 and may be taken only once for credit. Prerequisite: Upper-division standing.

## Wr 433 - Research Methods for Technical Writers (4)

Introduces students to the research methods commonly practiced by professional technical writers. These methods include interviewing subject-matter experts, researching genre conventions, user research, website content analysis, and usability testing. Students will practice methods via client-projects with local community partners, so the methods taught in any given section of the course will be shaped by the needs of the client-project. Students will produce professional-quality project deliverables for the client and the programportfolio.

Also offered for graduate-level credit as Wr 533 and may be taken only once for credit. Prerequisite: Upper-division standing.

## Wr 435 - Grammar for Writers (4)

Study and practice of contemporary English grammar and usage, with focus on the relationship between stylistic choices and their rhetoricaleffects.

Also offered for graduate-level credit as Wr 535 and may be taken only once forcredit. Prerequisite: Upper-division standing.

## Wr 456 - Forms of Nonfiction (4)

Explores various forms of nonfiction, including essay, personal essay, reviewing, immersion journalism, and memoir, with practice writing in each.

Also offered for graduate-level credit as Wr 556 and may be taken only once for credit. . Prerequisite: Wr214 or Wr 228. Instructor approval required.

## Wr 457 - Pers onal Essay Writing (4)

The history and contemporary use of personal es say as a mode of creative communication; gives an understanding of and practice in this kind of writing.
Also offered for graduate-level credit as Wr 557 and may be taken only once for credit. . Prerequisite: Wr214 or Wr 228. Instructor approval required.

## Wr 458 - Magazine Writing (4)

Examines the development of both long-and short-form magazine pieces, as well as the business and economics of
magazine publishing. Students write and peer-critique articles in the styles and formats of a variety of publications and magazine departments.
Also offered for graduate-level credit as Wr 558 and may be taken only once forcredit. . Prerequisite: Wr 214 or Wr 228. Instructor approval required.

## Wr 459 - Memoir Writing (4)

Concentrates on elements necessary for writing successful personal narrative, including structure, tone/voice, dialogue, characterization, tense, and point-of-view. Memoirs will be read and discussed, and students will turn in several pieces over the course of the termfor workshop discussion.
Also offered for graduate-level credit as Wr 559 and may be taken only once for credit. . Prerequisite: Wr 214 or Wr 228. Instructor approval required.

## Wr 460 - Introduction to Book Publishing (4)

Provides a detailed overview of the publishing process, organized around the division of labor, including introductions to contemporary American publishing, is sues of intellectual commerce, copyright law, publishing contracts, book editing, book design and production, book marketing and distribution, and bookselling. Based on work in mock publishing companies, students prepare portfolios of written documents, i.e., book proposals, editorial guidelines, design and production standards, and marketing plans. Guest speakers fromthe publishing industry and field trips provide exposure to the industry.
Also offered for graduate-level credit as Wr 560 and may be taken only oncefor credit. . Prerequisite: Upperdivision standing.

## Wr 461 - Book Editing (4)

Provides a comprehensive course in professional book editing, including editorial management, acquisitions editing, substantive/developmentalediting, and copyediting. Issues specific to both fiction and nonfiction books will be covered.
Also offered for graduate-level credit as Wr 561 and may be taken only oncefor credit. . Prerequisite: Upperdivision standing.

## Wr 462 - Book Design Software (4)

Comprehensive course in professional book design and production. Issues specific to the design of fiction and nonfiction books in a variety of genres and markets will be covered, including the applications of bothold and new technologies in design and production.
Also offered for graduate-level credit as Wr 562 and may be taken only once for credit. . Prerequisite: Upperdivision standing.

## Wr 463 - Book Marketing (4)

Comprehensive course in professional book marketing. Is sues specific to the marketing of fiction/nonfiction books in variety of genres and markets will be covered. Students will do market research, produce marketing plans, write press releases, write advertising copy, and develop related marketing materials.
Also offered for graduate-level credit as Wr 563 and may be taken only once for credit. . Prerequisite: Upperdivision standing.

## Wr 464 - Business of Book Publishing (4)

Comprehensive course in the business of book publishing. Topics covered include publications management, accounting, book production, distribution, and books elling. Students learn how a variety of agents, including publishers, publishing service companies, distributors, wholesalers, bookstores, etc., are organized.
Also offered for graduate-level credit as Wr 564 and may be taken only once for credit. . Prerequisite: Wr460.

## Wr 465 - Intellectual Property and Copyright (4)

Outlines opportunities and pitfalls faced by writer (editor, graphic designer, artist) in legal and ethical spheres. Copyright law, U.S. First Amendment law, defamation, right of privacy, trademark, trade secret law. Discusses the importance of the Internetin rethinking copyright and intellectual property rules.
Also offered for graduate-level credit as Wr 565 and may be taken only once for credit. . Prerequisite: Upperdivision standing.

## Wr 466 - Digital Skills (4)

Gives hands-on training in digital skills and surveys developmental trends in writing in computational environments: webpages, computer programs, word processing programs, multimodales says. Learn core principles and methods of web design, web management, media history, and present-day uses of authoring software. Assess scholarly articles about writing and reading in computational environments.
Also offered for graduate-level credit as Wr 566 and may be taken only once for credit. Prerequis ite: Upper-division standing.

## Wr 471 - Typography, Layout, and Production (4)

Comprehensive course in professional book design and production. Is sues specific to the design of fiction and nonfiction books in a variety of genres and markets will be covered.
Also offered for graduate-level credit as Wr 571 and may be taken only once for credit. . Prerequisite: Wr 462.

## Wr 472 - Copyediting (4)

Learn how to improve the clarity, coherency, consistency, and correctness of other people's writing through application of grammatical and stylistic guidelines. Study grammar, usage, punctuation, and style. Narrow focus on editing at the line and substantive level, with little to no attention given to broad development of a manuscript.

Also offered for graduate-level credit as Wr 572 and may be taken only onceforcredit. .Prerequisite: Wr 461.

## Wr 473 - Developmental Editing (4)

Explores the relationship between an editor, a writer, and the work in the process of developmental editing-also known as global, substantive, or comprehensive editing. Examines historically significant editor/author relations, how the editorial process and relationships have changed over time, and how editorial expectations shift based on the expectations of the publisher, the constantly changing global marketplace, and the introduction of new technologies.

Also offered for graduate-level credit as Wr 573 and may be taken only once for credit. . Prerequisite: Wr 461.

## Wr 474 - Publishing Studio (4)

Perform the work of a real publishing house, from acquiring manuscripts to selling books. Gain publishing experience by participating in the various departments of a student-staffed publishing house, Ooligan Press. Departments include Acquisitions, Editing, Design and Sustainable Production, Marketing, External Promotions, Sales, DigitalContent, SocialMedia, and Project Management and Operations. Course may be repeated multiple times.
Also offered for graduate-level credit as Wr 574. . Prerequisite: Wr475.

## Wr 475 - Publishing Lab (1)

Perform the work of a real publishing house, from acquiring manuscripts to selling books. Gain publishing experience by participating in the various departments of a student-staffed publishing house, Ooligan Press. Departments include Acquisitions, Editorial, Design, Marketing and Sales, Digital, and Social Media. Course may be taken multiple times for credit.
Also offered for graduate-level credit as Wr 575.
Prerequisite: Upper-division standing.
Wr 476 - Publishing for Young Adults (4)
Study the techniques commonly deployed by writers and publishers of young adult and middle grade literature.
Also offered for graduate-level credit as Wr 576 and may be taken only once for credit. .

## Wr 477 - Children's Book Publishing (4)

Study the techniques commonly used by writers and publishers of children's literature.
Also offered for graduate-level credit as Wr 577 and may be taken only once for credit. . Prerequisite: Upperdivision standing.

## Wr 478 - Digital Marketing for Book Publishers (4)

This course examines the contexts and impacts of digital book marketing on the book industry, authors, and readers.
Also offered for graduate-level credit as Wr 578 and may be taken only once for credit. Prerequisite: Upper-division standing.

## Wr 480 - Advanced Book Design (4)

Builds upon the Adobe InDesign, Photoshop, Illustrator, and Acrobat skills that students developed in WR 462/562 BookDesign Software and further applied in WR 471/571 Typography, Layout, and Design. This class utilizes handson design projects that incorporate more advanced book des ign skills in terms of workflow, indexing, illustrations, visual data representations, etc.
Also offered for graduate-level credit as Wr 580 and may be taken only once for credit. Prerequis ite: Wr 471.

## Wr 481 - Ebook Production (4)

Ebook Production teaches the hands-on skills of digital publishing. The course will build on an established understanding of basic text-based languages like HTML, CSS, and XML. Students will be introduced to new tools like iBooks Author, oXygen, and Sigil.
Also offered for graduate-level credit as Wr 581 and may be taken only once for credit. Prerequisite: Upper-division standing.

## Wr 500 - Advanced Topics in Composition (4)

Advanced study of writing theory and practice, with focus on rhetoric, genre, and process. Course may be repeated for credit with different topics for up to 8 credits.

Also offered for undergraduate-level credit as Wr 400.
Wr 501 - Research (1-12)
(Credit to be arranged.)

## Wr 502 - Independent Study (1-6)

(Credit to be arranged.)

Wr 503 - Thesis (1-12)
(Credit to be arranged.)

## Wr 504-Cooperative Education/Internship (1-9)

See department for course description. (Credit to be arranged.)

## Wr 505 - Writing and Conference (1-6)

Consent of instructor. See department forcourse description. (Credit to be arranged.)

## Wr 506-Special Projects (1-8)

(Credit to be arranged.)

## Wr 507 - Writing Seminar (1-6)

Consent of instructor. See department for course description. (Credit to be arranged.)

## Wr 509-Practicum(1-9)

## Wr 510 -Selected Topics in Writing (0-6)

See department for course description. (Credit to be arranged.)

## Wr 511 - Internship (1-4)

Students apply their academic training and skills in the workforce, further developing those skills and learning new skills in the process. Students develop a better understanding of the value to employers of their education in literature, writing, and/or publishing. Integrating an internship with reflection and professional development enhances the experience.
Also offered for undergraduate-levelcredit as Wr 411 . Prerequisite: Permis sion of instructor.

## Wr 512 -Graduate Fiction Writing (4)

Students will further refine their skills by writing longer and more ambitious works of fiction, as well as confront a variety of technical problems emerging fromclass discussion.

## Wr 513 -Fiction Writing (4)

An intensive course for writers who are currently embarked on a project involving the writing of fiction, whether short story, novella, or novel. Recommended prerequisites: $\mathrm{Wr} 212,312,412$ or their equivalents. Consent of instructor required.

## Wr 514 - Graduate Poetry Writing (4)

Within a workshop format of writing, revising, critiquing and reading, students will strengthen their writing skills, and their understanding of how poems work. May be repeated once for credit.

## Wr 515 - Poetry Writing II (4)

Advanced poetry writing at the graduate level. Builds on Wr 514, ass umes students will submit their work for publication. Traditional works hop format in which students write, revise, and respond to the poems of others. May be repeated for credit. Recommended prerequisite: Wr 514.

## Wr 516-Screenwriting (4)

Students will be introduced to the process of conceiving, structuring, writing, rewriting, and marketing a screenplay for the contemporary American marketplace. "Screenplay paradigms" will be discussed, and a variety of movies will be analyzed. May be repeated forcredit.
Also offered for undergraduate-level credit as Wr 416.

## Wr 520 - Writing Studio(4)

Pursuit of advanced writing projects, with focus on process, response, reflection, and revision. Course may be repeated forcredit with different topics.
Also offered for undergraduate-level credit as Wr 420.
Wr 521 - MFA Core Workshopin Fiction (4)
The MFA Core Workshop in Fiction focuses on the writing, revis ion, and critical discussion of student short stories and chapters from novels. Students' critical analyses of their peers' work are informed by their study of published fiction in the texts, supplemented by lectures clarifying technical strategies in the writing of fiction. May be taken up to sixtimes for credit. This course is restricted to graduate students admitted to the Writing Program (Fiction).

## Wr 522-MFA Core Workshopin Poetry (4)

The MFA Core Works hop in Poetry focuses on the writing, revision, and critical dis cussion of student poems. Students' verbal and written critical analyses of their peers' work are informed by their reading of publis hed poems representing a range of formal strategies and his torical and cultural contexts, and by their reading in prosody and poetics. May be taken up to sixtimes for credit. This course is restricted to graduate students admitted to the Writing Program(Poetry).

## Wr 523 - MFA Core Workshopin Nonfiction (4)

The MFA Core W orkshop in Nonfiction concentrates on elements necessary for writing successful nonfiction prose --including structure, voice, dialog, characterization, and point-of-view-- with a primary emphas is on the in-class workshop and peer review of student pieces. Nonfiction models, both short pieces and book-length, will be read and dis cussed, and students will write critical responses regarding those models. May be taken up to sixtimes for credit. This course is restricted to graduate students admitted to the Writing Program(Nonfiction).

## Wr 524 - Grant Writing for Professional Writers (4)

Introduces students training for careers as professional writers to the best practices in writing grants and managing the grant writing process across multiple sectors of the non-profit world and in academia. Students will work collaboratively and individually to develop business plans, identify potential funding sources, and begin preparing grants.
Also offered for undergraduate-levelcredit as Wr 424 and may be taken only once for credit.

## Wr 525 - Advanced Technical Writing (4)

Study and practice of foundational ways of thinking and profes sional skills for students planning to pursue a role or a career as a technical writer across a variety of industries and disciplines, including technology, health, engineering, science, manufacturing, and non-profits. Course topics include audience analysis, writing and editing in plain language for diverse audiences, common genres, ethics, collaborative writing, and project management. Students author individual and collaborative projects for a pers onal or programprofessional portfolio.
Also offered for undergraduate-level credit as Wr 425 and may be taken only once for credit.

## Wr 526 - Document Design (4)

Document planning, creation, and revision, including discussion of the use and abuse of language in business, government, ins urance, and law. Students will consider general strategies for document production; analyze different document styles; address questions of target audience; evaluate documents for readability and efficiency; and study the Plain English Movement and its legis lative and legal implications.

Also offered for undergraduate-levelcredit as Wr426 and may be taken only once for credit.

## Wr 527 - Technical Editing (4)

Gives technical writers practice in technical editing by exposing themto samples of a variety of documents from the files of organizations in the surrounding community.

As a community based learning course, it requires students to interact with community partners in collaborative student teams. May be repeated for a maximum of 8 credits.

Also offered for undergraduate-level credit as Wr 427.

## Wr 528 - Advanced Media Writing (4)

Building on the journalismskills learned in Media Writing and Media Editing, students use Portland to cover and write stories fromcommunity sources. Students are also introduced to reporting on a regular basis fromnews beats of their choosing.

Also offered for undergraduate-level credit as Wr 428 and may be taken only once for credit.

## Wr 529 - Writing Computer Documentation (4)

Develop skills in writing computer documentation, primarily user manuals and system specifications. Focuses on analyzing informational needs of the audience, and defining and explaining computer terms and concepts for non-technical and semi-technical audiences. Expected preparation: Wr327, ISQA 111 orCS 105 or equivalent, word processing skills.
Also offered for undergraduate-level credit as Wr 429 and may be taken only once for credit. .

## Wr 530 - DesktopPublishing II (4)

Builds from the foundation in Desktop Publishing Ito explore further the skills needed to produce publications in the computer age. Topics includetypography, page layout, photography, and informational graphics, with a special emphas is on hands-on project production of a 12-page news letter or magazine.
Also offered for undergraduate-level credit as Wr 430 and may be taken only once for credit.

## Wr 531 - Advanced Topics in Technical Writing Technologies (4)

An introduction to contemporary technology used by writers in industry. Students will produce a portfolio project to demonstrate proficiency in the technology. Students will also learn general strategies for learning new technologies as partof a profes sional practice. This course is repeatable for up to 16 credits.

Also offered for undergraduate-level credit as Wr 431.

## Wr 532 - Frameworks for Technical Writing (4)

Introduces students to the many frameworks for understanding the fundamental questions that shape technical writing as a practice in industry and as a field of academic study, such as rhetoric, ethics, or social justice. Students will choose a framework to analyze and respond to a technical writing problemorsituation of their choice and produce a portfolio to share findings.

Also offered for undergraduate-levelcredit as Wr432 and may be taken only once for credit.

## Wr 533 - Res earch Methods for Technical Writers (4)

Introduces students to the research methods commonly practiced by professional technical writers. These methods include interviewing subject-matter experts, researching genre conventions, user research, website content analysis, and usability testing. Students will practice methods via client-projects with local community partners, so the methods taught in any given section of the course will be shaped by the needs of the client-project. Students will produce professional-quality project deliverables for the client and the programportfolio.
Also offered for undergraduate-level credit as Wr433 and may be taken only once for credit.

## Wr 535 - Grammar for Writers (4)

Study and practice of contemporary English grammar and us age, with focus on the relationship between stylistic choices and their rhetorical effects.

Also offered for undergraduate-levelcredit as Wr 435 and may be taken only once for credit. . Prerequis ite: Senior or graduate status.

## Wr 540 - Technical Writing Portfolio Workshop (1)

Provides a structured and collaborativeenvironment for authoring the Master's in Professional and Technical Writing graduation portfolio requirement. Students explore the rhetorical, design, and technical is sues related to portfolio creation. May be repeated twice for credit.

## Wr 550 - Portland Review (1-2)

Graduate students will gain hands-on editorial, publishing, and marketing knowledge while collaboratively producing and operating Portland Review, an (online) international literary journal. By participating in Portland Review's publication process and understanding the practices of running a literary journal, students will gain practical experience in the field of literary publishing. May be repeated for up to 8 credits.

## Wr 556 - Forms of Nonfiction (4)

Explores various forms of nonfiction, includingessay, personal essay, reviewing, immersion journalism, and memoir, with practice writing in each.

Also offered for undergraduate-level credit as Wr 456 and may be taken only once for credit. . Prerequis ite: Wr 214 or Wr228. Instructor approval required.

## Wr 557 - Pers onal Essay Writing (4)

The his tory and contemporary use of personal es say as a mode of creative communication; gives an understanding of and practice in this kind of writing.
Also offered for undergraduate-level credit as Wr 457 and may be taken only once for credit. .

## Wr 558 - Magazine Writing (4)

Examines the development of both long-and short-form magazine pieces, as well as the business and economics of magazine publishing. Students write and peer-critique articles in the styles and formats of a variety of publications and magazine departments. .
Also offered for undergraduate-level credit as Wr 458 and may be taken only once for credit. .

## Wr 559 - Memoir Writing (4)

Concentrates on elements necessary for writing successful pers onal narrative, including structure, tone/voice, dialogue, characterization, tense, and point-of-view. Memoirs will be read and discussed, and students will turn in several pieces over the course of the termfor workshop discussion.

Also offered for undergraduate-level credit as Wr 459 and may be taken only once for credit. . Prerequisite: Wr 214 or Wr 228. Instructor approval required.

## Wr 560 - Introduction to Book Publishing (4)

Provides a detailed overview of the publishing process, org anized around the division of labor, including introductions to contemporary American publishing, is sues of intellectual commerce, copyright law, publishing contracts, book editing, book design and production, book marketing and distribution, and bookselling. Based on work in mock publishing companies, students prepare portfolios of written documents, i.e., book proposals, editorial guidelines, design and production standards, and marketing plans. Guest speakers from the publishing industry and field trips provide exposure to the industry.

Also offered for undergraduate-level credit as Wr 460 and may be taken only once for credit.

## Wr 561 - Book Editing (4)

Provides a comprehensivecourse in professional book editing, including editorial management, acquisitions editing, substantive/developmentalediting, and copyediting. Is sues specific to both fiction and nonfiction books will be covered.

Also offered for undergraduate-level credit as Wr 461 and may be taken only once for credit.

## Wr 562 - Book Design Software (4)

Provides a strong foundation in design software used in the book publishing industry, focusing on Adobe InDesign.

Also explores Adobe Photoshop, Illustrator, and Acrobat, as well as XHTMLand e-book design. The class considers audience expectations through a range of hands-on design projects.
Also offered for undergraduate-levelcredit as Wr 462 and may be taken only once for credit.

## Wr 563 - Book Marketing (4)

Comprehensive course in professional book marketing. Issues specific to marketing of fiction and nonfiction books in variety of genres and markets will be covered. Students will do market research, produce marketing plans, write press releases, write advertising copy, and develop related marketing materials.
Also offered for undergraduate-level credit as Wr 463 and may be taken only once for credit.

## Wr 564 - Business of Book Publishing (4)

Comprehensive course in the business of book publishing. Topics covered include publications management, accounting, book production, dis tribution, and bookselling. Students learn how a variety of agents, including publishers, publishing services companies, distributors, wholes alers, bookstores, etc., are org anized and function in the marketplace.

Also offered for undergraduate-levelcredit as Wr 464 and may be taken only once for credit.

## Wr 565 - Intellectual Property and Copyright (4)

Outlines opportunities and pitfalls faced by writer (editor, graphic designer, artist) in legal and ethical spheres. Copyright law, U.S.First Amendment law, defamation, right of privacy, trademark, trade secret law. Discusses the importance of the Internet in rethinking copyright and intellectual property rules.
Also offered for undergraduate-level credit as Wr 465 and may be taken only once for credit.

## Wr 566 - Digital Skills (4)

Gives hands-on training in digital skills and surveys developmental trends in writing in computational environments: webpages, computer programs, word processing programs, multimodal essays. Learn core principles and methods of web design, web management, media history, and present-day uses of authoring software. Assess scholarly articles about writing and reading in computational environments.
Also offered for undergraduate-level credit as Wr 466 and may be taken only once for credit.

## Wr 571 - Typography, Layout, and Production (4)

Comprehensive course in professional book design and production. Issues specific to the design of fiction and
nonfiction books in a variety of genres and markets will be covered.

Also offered for undergraduate-level credit as Wr471 and may be taken only once for credit. . Prerequisite: Wr 562.

## Wr 572 - Copyediting (4)

Learn how to improve the clarity, coherency, consistency, and correctness of other people's writing through application of grammatical and sty listic guidelines. Study grammar, usage, punctuation, and style. Narrow focus on editing at the line and substantive level, with little to no attention given to broad development of a manuscript.

Also offered for undergraduate-level credit as Wr 472 and may be taken only once forcredit. . Prerequisite: Wr 561.

## Wr 573 - Developmental Editing (4)

Explores the relationship between an editor, a writer, and the work in the process of developmentalediting-also known as global, substantive, or comprehensive editing. Examines historically significant editor/author relations, how the editorial process and relationships have changed over time, and how editorial expectations shift based on the expectations of the publisher, the constantly changing global marketplace, and the introduction of new technologies.

Also offered for undergraduate-level credit as Wr473 and may be taken only once for credit. . Prerequis ite: Wr 561.

## Wr 574 - Publishing Studio (4)

Perform the work of a real publishing house, from acquiring manuscripts to selling books. Gain publishing experience by participating in the various departments of a student-staffed publishing house, Ooligan Press. Departments include Acquisitions, Editing, Design and Sustainable Production, Marketing, External Promotions, Sales, Digital Content, Social Media, and Project Management and Operations. May be taken multiple times for credit.

Also offered for undergraduate-level credit as Wr 474. Prerequisite: Wr 575.

## Wr 575 - Publishing Lab (1)

Perform the work of a real publishing house, from acquiring manuscripts to selling books. Gain publishing experience by participating in the various departments of a student-staffed publishing house, Oolig an Press. Departments include Acquisitions, Editorial, Design, Marketing and Sales, Digital, and Social Media. May be taken multiple times for credit.
Also offered for undergraduate-level credit as Wr 475.
Wr 576 - Publishing for Young Adults (4)
Study the techniques commonly deployed by writers and publishers of young adult and middle grade literature.

Also offered for undergraduate-levelcredit as Wr 476 and may be taken only once for credit.

## Wr 577 - Children's Book Publishing (4)

Study the techniques commonly used by writers and publishers of children's literature.

Also offered for undergraduate-level credit as Wr 477 and may be taken only once for credit.

## Wr 578 - Digital Marketing for Book Publishers (4)

This course examines the contexts and impacts of digital book marketing on the book industry, authors, and readers.

## Wr 579 - Res earching Book Publishing (4)

Students will learn about book publishing research methods (both qualitative and quantitative) and work through various stages of their final research paper for the culmination of the Book Publishing Master's Program. This course may be repeated once forcredit.

## Wr 580 - Advanced Book Design (4)

Builds upon the Adobe InDesign, Photoshop, Illustrator, and Acrobat skills that students developed in WR 462/562 BookDesign Software and further applied in WR 471/571 Typography, Layout, and Design. This class utilizes handson design projects that incorporate more advanced book design skills in terms of workflow, indexing, illustrations, visualdata representations, etc.
Also offered for undergraduate-level credit as Wr 480 and may be taken only once for credit. Prerequisite: Wr571.

## Wr 581 - Ebook Production (4)

Ebook Production teaches the hands-on skills of digital publishing. The course will build on an established understanding of basic text-based languages like HTML, CSS, and XML. Students will be introduced to new tools like iBooks Author, oXygen, and Sigil.
Also offered for undergraduate-level credit as Wr 481 and may be taken only once for credit. Prerequisite: Wr 562.

## Wr 582 - Literary Agents and Acquisitions (4)

Offers an in-depth examination of how a book gets selected for publication by those in the traditional role of gatekeeper: literary agents and acquisitions editors. Topics discussed will include selecting book projects from authors, submitting those book projects to publishers, negotiating terms for contracts, managing translation and film rights (called subsidiary rights), overseeing author book publicity and marketing, planning and managing an author's long-termcareer, and navigating career paths for as piring agents and acquisitions editors.

## WS - Women's Studies

## WS 101 - Introduction to Women's Studies (4)

An overview of a range of topics fromboth a contemporary and historic feminist lens.Emphasizes an intersectional critical analysis of how various is sues impact individuals and communities. Comprehensive introduction to feminist perspectives, expanding students' awareness of resistance to systems of oppression and resulting structural and social change.

## WS 120 - Workshopfor Returning Women (4)

Designed for those who have experienced an interruption in their formal education. Examines the educational history of American women. Analyzes the ways in which the roles, status, and experiences of women affect educational decisions and performance. Includes the development of skills and self-confidence in studying, writing, research, examinations, time management, mathematics and science. Credit cannot be used to satisfy certificate requirements.

## WS 199 - Special Studies (0-12)

A variable topics course dealing with contemporary and historical issues in feminis $m$. Recent offerings have included History of Women Artists and History of Women in Science. WS 199 is also available forstudents who wish to pursuedirected independent study.

## WS 260 - Introduction to Women's Literature (4)

Study of literature written by and about women across historical periods and genres. This is the same course as Eng 260 and may be taken only once for credit.

## WS 299 -Special Studies (1-4)

(Credit to be arranged.)

## WS 301 - Feminisms: Theories and Analyses (4)

Engages students with a range of feminist theoretical perspectives that conceptualize gender and the intersectional factors (such as race, sexuality, indigeneity, class, ability) implicated in it. Addresses feminist knowledge production, agency, and power relations. Emphasis on the development of close reading and critical analys is using a range of sources and approaches.
Prerequisite: WS 101 or UnSt 231 or permis sion of instructor.

## WS 305 - Women of Color Feminist Theory (4)

Examines the development and foundational approaches of women of color feminist theories, including scholarship and activis $m$, through an intersectional lens in both national and transnational contexts.

Prerequisite: WS 101 or UnSt 231.

## WS 306U- Global Gender Issues (4)

Study of gender is sues in a global framework. Course will focus on a theme that can bestudied comparatively, such as women and the environment; race, gender and food justice; public policy and gender. Topic may also highlight a particular country or national/ethnic group. This course may be repeated with different topics.

## WS 307U- Resistance, Activism, and Social Change (4)

Focuses on activismof self-identified feminists as they res ist and transformoppression. Emphasizes queer and feminist activis mallied with other social movements. Examines activists' strategies, tactics, org anizations, goals, accomplishments, and unmet challenges. Topics may include reproductive justice, labor organizing, queer political movements, indigenous and transnational liberation movements, or climate justice.

## WS 308U- Topics in Gender, Literature, and Popular Culture (4)

Explores media, popular culture, and/or literature froma feminist pers pective which focuses on how gender and other dimensions of power relations are expressed, reproduced, and challenged within cultural expres sion. Topics may include gender and popular music; girls’ studies through media; class and gender in contemporary literature; depictions of masculinities in films/television; gender and the internet/social networking. This course may be repeated with different topics.

## WS 309 -Disney: Gender, Race, and Empire (4)

Explores construction of gender, race, and empire in the animated films of Disney. Examines the content of Disney films created within particular his torical and cultural contexts in order to understand cultural production in relation to intersections of racis $m$, sexis $m$, colonialis $m$, and imperialism.

## WS 310U - Psychology of Women (4)

Review and evaluate as sumptions underlying psychological research on women. Survey the research in areas such as the development of sexdifferences, acquisition of gender roles, and maintenance of gender
stereotypes. Explore the pertinence of these findings to topical areas such as women's work roles, women and mentalhealth, and the women's movement. Recommended prerequisite: 3 credits in psychology.

## WS 312U-Feminist Philosophy (4)

Critically examines traditional schools of philosophical thinking froma feminist pers pective. Recommended prerequis ite: one philosophy course from other than Phl 103, 104, 206.

## WS 317U- Writing as Activism (4)

Students will work intensively to developactivist writing projects individually and in collaboration with others. Investigate a variety of forms and sources of activist writing, generate new writing in weekly writing works hops, serve as writing partners/coaches with each other, and work cooperatively to complete communitybased, writing-involved activist projects.

## WS 320U- Introduction to Girls' Studies (4)

An overview of the field of girls? studies in the U.S., including the ways definitions of girlhood change depending on contexts of race, class, ethnic or national identity, gender identity and sexual orientation. Explores gendered ideals and negotiations of girlhood, concepts of girls? empowerment, theory and research methods.

## WS 330U- Women of Color in the United States (4)

A variable topics course focusing on is sues which affect women of color in the United States, historically and today.

## WS 331U- Women and the Middle East (4)

Aims to explore the role and status of women in the contemporary Middle East with respect to institutions such as the family, law, education, work and politics --areas which intersect and overlap with broader cultural questions about women and their place in tradition, modernity, nation-building, Is lamand the West. This course is the same as Intl331U and may only be taken once forcredit.
Cross-Listed as: Intl331U.

## WS 332U- Race, Class, Gender, and Sexuality in the United States (4)

Examines the ways in which race, class, gender, and sexuality are conceptualized and represented in contemporary U.S. culture and society; investigates the
institutions, practices, and discourses that comprise notions of race, class, gender, and sexuality in the United States and how these social categories shape and are shaped by one another.

## WS 337U- Communication and Gender (4)

An examination of similarities and differences in male and female communication styles and patterns. Particular attention given to the implications of gender as social cons truct upon perception, values, stereotyping, language use, nonverbal communication, and power and conflict in human relationships. Discussion of influence of mass communication upon shaping and constructing male and female roles.

## WS 340U- Women and Gender in America to 1848 (4)

Surveys the history of women in the middle North American continent to 1848 . It highlights the experiences of and relationships among women of diverse origins, especially Native women, Afric an women, and European women. Key themes includefamily, kinship, and sexgender systems; colonialismand slavery; religious life; politics and the law; nation-building and the rise of modem citizenship. Recommended prerequisite: upper division standing.

## WS 341 U- Women and Gender in America 1848-1920 (4)

Explores the diverse experiences of women in the United States between 1848 and 1920. Key themes include slavery, emancipation, and Reconstruction; colonialis m and res is tance; women's rights and social reform; education and wage labor; immigration/migration; and Victorianismand sexualmodernism. Recommended prerequisite: upperdivision standing.

## WS 342U- Women and Gender in the U.S. 1920 to the Present (4)

Surveys women's lives and gender change in recent U.S. history. Among our themes will be women in politics, the work force, and social movements as well as changes in family life, gender identities, and sexuality. Women's roles in globalization, the media, and popular culture will figure throughout. Recommended prerequisite: upper division standing.

## WS 343U - American Family History (4)

History of the American family from the colonial period to the present. The course will draw upon textual sources and
oral histories in examining changes in families in the colonial period, and the nineteenth and twentieth centuries. Recommended prerequisite: Hst 201, 202, Sophomore Inquiry (American Studies), or consent of instructor.

## WS 344U- Queer Ecologies (4)

Applies intersectional queer theories to concepts of nature and the environment, to investigate how gender and sexualities have been central in defining what counts as "natural" for people, places, and practices. Explores how gender and sexualities intersect with colonialism, disability, race, socialclass, and other categories through social and scientific approaches to nature and what is considered "natural" in human/non-human ecosystems.

## WS 346U- Genes \& Society (4)

Explores the principles of genetics, molecular biology and biotechnology within social and his torical context.
Emphasis on the ethical is sues arising fromthe intersection of genetics, technology and society, with attention to the role of gender, race and class in the formation and application of scientific knowledge. This is the same course as Bi 346 U and may be taken only once for credit.
Cross-Listed as: Bi 346U.

## WS 347U - Science, Gender, and Social Context (4)

Considers how gender, race and sexuality influence and are constructed by the theories and practice of science, using historical and contemporary examples. Explores the strengths and limitations of science to describe and predict human and non-human natural phenomena. Topics may include ecological, evolutionary, and environmental sciences. Laboratory and/or field experiences are included and emphasized. Companion course to WS 348U; can be taken in any order.
Cross-Listed as: This course is the same as Sci347U and may only be taken once for credit.

## WS 348U - Science, Gender, and Social Context (4)

Considers how gender, race and sexuality influence and are constructed by the theories and practiceofscience, using historical and contemporary examples. Explores the strengths and limitations of science to describe and predict human and non-human natural phenomena. Topics may include organis mal, cell/molecular, orbiomedical sciences. Laboratory and/or field experiences are included and emphasized. Companion course to WS 347U; can be taken in any order.
Cross-Listed as: This course is the same as Sci348U and may only be taken once for credit.

## WS 349U- Gender and International Development (4)

Examination of how gender mediates access to livelihoods, lived experiences of poverty, inequality, and other social power relations in developing countries. Analysis of critical development problems using a gendered lens and addressing urgent policy problems in developing countries. Understand how social construction of gender and materiality of gendered lives impact the experiences of capitalist development in the Global South.
Cross-Listed as: This is the same course as Int1349U and may be taken only once for credit.

## WS 350 - Introduction to Interpersonal Violence (1)

Explores the roots of interpersonal violence, the dynamics of domestic violence against women and children and sexual as sault, their causes and effects, community resources for intervention and prevention. Discusses the social norms that influence interpersonal violence as well as the psychological results of violence. Examines the big picture of interpersonal violence and how all forms are interrelated.

## WS 351 U- Gender and Education (4)

Explores the significance of gender in educational work. The focus will be on the history of gender arrangements in educational org anizations and the formation of gender roles in contemporary American society, particularly in the family, schools, and the economy. Students will examine differential socialization of males and females, ongoing practices in educational organizations that are gender-related and/or gender biased and the convergence of gender, race, and class in educational org anizations. This course is cross-listed as ELP 455; may only be taken once forcredit.

## WS 354 - Interpers onal Violence and Special Populations (1)

Physical, emotional and sexual abuse crosses all age, cultural, religious, ethnic, economic and social boundaries. However, the impact of abuse and the remedies and services available to victims/ survivors varies widely across different social groups. WS 354: Young Adults and Dating Violence; WS 355: Battered Women in Prison; WS 356: Diversity Awareness and Domestic and Sexual Violence. Each class will consider physical, emotional and sexual abuse. This is the first course in a sequence of three: WS 354, WS 355, and WS 356. Recommended prerequisite: WS 350.

## WS 355 - Interpers onal Violence and Special Populations (1)

Physical, emotional and sexual abuse crosses all age, cultural, religious, ethnic, economic and social boundaries. However, the impact of abuse and the remedies and services available to victims/ survivors varies widely across different social groups. WS 354: Young Adults and Dating Violence; WS 355: Battered Women in Pris on; WS 356: Diversity Awareness and Domestic and Sexual Violence. Each class will consider physical, emotional and sexual abuse. This is the second course in a sequence of three: WS 354, WS 355, and WS 356. Recommended prerequisite: WS 350.

## WS 356 - Interpers onal Violence and Special Populations (1)

Physical, emotional and sexual abuse crosses all age, cultural, religious, ethnic, economic and social boundaries. However, the impact of abuse and the remedies and services available to victims/ survivors varies widely across different social groups. WS 354: Young Adults and Dating Violence; WS 355: Battered Women in Prison; WS 356: Diversity Awareness and Domestic and Sexual Violence. Each class will consider physical, emotional and sexual abuse. This is the third course in a sequence of three: WS 354, WS 355, and WS 356. Recommended prerequisite: WS 350.

## WS 357 - Interventions for Interpersonal Violence (1)

This course sequence will consider interpersonal violence and intervention froma variety of perspectives --as an individual and societal issue. WS 357: Interventions to Help Women Caught in Interpersonal Violence; WS 358: Treatment Philos ophies and Interpersonal Violence; WS 359: Holding Perpetrators of Interpersonal Violence Accountable. Each class will address physical, emotional and sexual abuse is sues. This is the first course in a sequence of three: WS 357, WS 358, and WS 359. Recommended prerequis ite: WS 350.

## WS 358 - Interventions for Interpersonal Violence (1)

This course sequence will consider interpersonal violence and intervention froma variety of perspectives --as an individual and societal is sue. WS 357: Interventions to Help Women Caught in Interpersonal Violence; WS 358: Treatment Philos ophies and Interpersonal Violence; WS 359: Holding Perpetrators of Interpersonal Violence Accountable. Each class will address physical, emotional and sexual abuse is sues. This is the second course in a sequence of three: WS 357, WS 358, and WS 359. Recommended prerequisite: WS 350.

## WS 359 - Interventions for Interpersonal Violence (1)

This course sequence will consider interpersonal violence and intervention froma variety of perspectives --as an individual and societal is sue. WS 357: Interventions to Help Women Caught in Interpersonal Violence; WS 358: Treatment Philosophies and Interpersonal Violence; WS 359: Holding Perpetrators of Interpersonal Violence Accountable. Each class will address physical, emotional and sexual abuse issues. This is the third course in a sequence of three: WS 357, WS 358, and WS 359. Recommended prerequisite: WS 350.

## WS 360U - Introduction to Queer Studies (4)

An interdisciplinary course that focuses on the lives of lesbian, gay, bis exual, and trans people in his torical and social context. Looks at the historical roots and political uses of sexual norms and sexual identities and explores the complex interactions of race, class, gender, and desire. Finally, looks at some of the current political contests around sexuality.

## WS 361 -Sexual Assault (1)

Examines sexual ass ault fromhistorical, political, and psychological perspectives; the legal and medical systems' responses to sexual as sault; and the trauma that results from rape and the options for healing. Recommended prerequisite: WS 350.

## WS 362 - Women and Trauma (2)

Examines effects of trauma on the brain and brain functioning, psychological effects of childhood trauma, resilience as a factor in coping with traumatic experiences, and how to foster healing in trauma survivors.
Recommended prerequisite: WS 350.

## WS 363-Moving Beyond Trauma (1)

Examines survival frominterpersonal violence, draws on resiliency research to understand what fosters healing, explores the role of support systems, altruis m , spirituality, and social activismin overcoming trauma.

## WS 365U- The Science of Gendered Bodies (4)

The scientific gendering of the human body is studied from an interdisciplinary and intersectional queer and feminist perspective integrating biology, health and medicine with current and historical social, cultural and political forces.

Cross-Listed as:This is the same course as Sci365U and may be taken only once for credit.

## WS 367U - War, Sexual Violence and Healing (4)

Addresses various forms and causes of human rights violations during periods of both conflict and peace. Examines how poverty, injustice and gender-based inequalities reflect the political-economic structures that perpetuate gender-based violence among people. Students will investigate methods and means tocombat such violence and facilitate healing.

## WS 369U- Global Reproductive Justice (4)

This survey course explores movements for reproductive justice within the U.S. and globally. Weexamine reproductiverights organizing, reproductive health, and the impacts of race, class, gender, sexuality, nationality and ability among other identities on groups seeking to exercise reproductive autonomy.

## WS 370U-History of Sexualities (4)

Looks at the various meanings given to sexual desires and practices throughout history. Explores sexuality as reproduction, perversion, pleasure, and as a site of both social/political regulation and subversive agency. Focuses on change over time in the North American context emphasizing the contests involving sexuality beginning with the period of European conquest and ending with looking at HIV/AIDS and trans gender is sues.

## WS 372U- Topics in Literature, Gender, and Sexuality (4)

Study of representations of gender and sexuality in literature and related cultural forms. Course may be repeated for up to 8 credits with different topics.
Cross-Listed as: This is the s ame course as Eng 372U.

## WS 373 - Queer Philosophy (4)

The aim of this course is to illuminate the theoretical underpinnings and the radicalepistemological, social, and political possibilities that are afforded by queer philosophy/theory. Queer Philosophy problematizes and challenges rigid identity categories, norms of sexuality and gender and the oppression and violence that such norms justify. This course will interrogate the metaphysical, epistemological, phenomenological, social, and political dimensions of queer philosophy.
Cross-Listed as: This is the same course as Phl373 and may be taken only once for credit.

## WS 374U- Memoir, Gender, and Sexuality (4)

Students will explore the possibilities and limitations of the memoir form, examine the diverse aesthetics of this personally political writing, investigate theres onance "memoir" has across and within categories of difference (e.g., race, indigeneity, ethnicity, gender, nationality, sexuality, class, ability, and appearance), and reflect on the meaning these writings have for us individually and collectively. Students will critically engage with the assigned texts and their own writing.

## WS 375U - Topics in Sexuality Studies (4)

Study of different topics related to sexuality. Topics will vary from term to term.

## WS 377U-Topics in FeministSpirituality (4)

Investigation of different forms of feminist spirituality. Topics may includefeminist biblical interpretation, goddesses and spirituality, and eco-feminist spirituality. This course may be repeated with different topics

## WS 379U- Feminist Care Ethics (4)

Provides a comprehensive introduction to care ethics from its origins in feminist theory to its present multidisciplinary and international manifestations. The implications of care ethics for ontology, epistemology, aesthetics, identity, performativity and moral theory are addressed. Care ethics is differentiated frommains treamethical theories. Care theory is applied to a variety of academic and profes sional disciplines including but not limited to business, education, healthcare, literature, political science, performance studies, and psychology.
Cross-Listed as: This is the same course as Ph1379U and may be taken only once for credit.

## WS 380U - Women and Politics (4)

Analysis of the political role of women in politics. Reviews historical and contemporary analyses of women's participation and status in politics. Recommended prerequisites:PS 101, 102 or upper-division standing.

## WS 381 - Queer of Color Theorizing and Perspectives (4)

Utilizing critical race, feminist, queer, decolonial, and materialist analyses, queer of color theories high light the intersections of race, sexuality, and nations. An overview of the development and foundational approaches to queer of color critiques, as well as an opportunity to apply these theories to contemporary issues.

Prerequisite: WS 360U or WS 305.

## WS 382U- Transgender Studies (4)

Focus on contemporary transgender lives and politics; it is an introduction to the field of Trans gender Studies. Analyze lived realities and academic scholarship. Topics may include: transgender his tory, health care justice, violence and discrimination, the prison-industrial complex, and exclusion and inclusion in feminist and LGBTQ politics.

## WS 387 - Feminist Organizations: Theory and Practice (4)

An introduction to the theory and practice of feminist nonprofit org anizations. Attention to the history of feminist non-profit organizations in the U.S., political and social structures that impact such organizations, and decisionmaking and management is sues related to feminist concepts of power. Partnering with a local feminist nonprofit, students will gain hands-on knowledgeof how feminist org anizations strive to put theory into practice.
Prerequisite: WS 307 or junior standing.
WS 399 - Special Studies (1-6)
(Credit to be arranged.)

WS 401 - Research (1-6)
(Credit to be arranged.)

WS 402 - Independent Study (1-12)
(Credit to be arranged.)

## WS 404 - Cooperative Education/Internship (1-12)

(Credit to be arranged.)

## WS 405 - Reading and Conference (1-6)

(Credit to be arranged.) Consent of instructor.

## WS 407 -Seminar (1-6)

(Credit to be arranged.)

## WS 409 - Practicum(1-12)

(Credit to be arranged.)

## WS 410 -SelectedTopics (1-6)

(Credit to be arranged.)

## WS 411 - Experiential Learning Seminar (2)

Required during the first termof WS 409 practicum. Serves as a learning community for students to present and reflect on theircommunity-based practicumexperiences. Participants critically as sess the contexts in which they are operating and analyze the relationship between critical theory and practice.

Prerequisite: Upper division standing and permis sion of the instructor.

## WS 412 -Feminist Methodologies (4)

Introduces a range of feminist research methodologies, emphasizing interconnections among race, gender, sexuality, class, disability and other aspects of difference. Assesses knowledge-generating strategies in terms of their suitability for feminist research and addressing power relations. Development of critical awareness in doing selfdirected feminist, queer, decolonial and critical race research.
Also offered for graduate-level credit as WS 512 and may be taken only once forcredit. .Prerequisite: (WS 301 and WS 305) or WS 381.

## WS 415 -Senior Seminar (4)

Focuses on developing and completing an independent project using feminist and/or queer theories and methodologies. Structured works hop format where students will be guided through their project with peer and instructor feed back. Students will work collaboratively as well as independently.
Prerequisite: WS 412.

## WS 417 -Women in the Economy (4)

Different economic theoretical perspectives are presented to account for women's particular economic roles currently and historically. Emphas is on women's responsibility for child rearing and housework; women's relatively low wages; occupational segregation by gender; economic differences among women due to ethnicity, generation, and class; and policy iss ues with particular importance for women's economic situation. Expected preparation: Ec 201, Ec 202.
Also offerer for graduate-levelcredit as WS 517 and may be taken only once forcredit.

## WS 422 - Critical Perspectives on Quantitative Analysis (4)

Uses critical Indigenous, decolonizing, feminist and antiracist lenses to evaluate quantitative research applications, including development of research questions; study
designs; appropriate use of statistical and other quantitative methods; audience and dissemination of quantitative findings. Interdisciplinary and intersectional focus and applications. Note: Not a methods course; does not teach statistical orquantitative methods.
Also offered for graduate-level credit as WS 522 and may be taken only once for credit. Prerequis ite: Familiarity and experience with basic statistical and quantitative data and methods. Instructor permis sion required. Cross-Listed as: This is the same course as GRN 422 and may be taken only once for credit.

## WS 424 - Women and the Law (4)

Examines the relationship between women and the law. The first half of the course considers several theories of women's equality. During the second half of the course students will apply these theories to a variety of problems in gender justice. Substantive is sues covered may include: sexual harassment, abortion, fetal protection policies, and pornography. This course is the same as PS 425; may only be taken once forcredit.
Cross-Listed as: PS 425.

## WS 425 - Sociology of Gender (4)

Consideration of the theoretical, methodological, and empirical contributions of current sociological scholarship on gender. Emphasis on the intersection of gender, sexuality, race/ethnicity, and class. Analysis of topics such as: masculinity/femininity, parenting, family, education, work, sexualities, reproduction, politics, and social change. This is the same course as Soc 425 and may be taken only once for credit.
Also offered for graduate-level credit as WS 525 and may be taken only once for credit. .Prerequisite: junior standing. Cross-Listed as: Soc 425.

## WS 426 - Gender \& Mental Health (4)

Social and historical explanations of, and researchon, mental illness and mental health, with a focus on gender. Contemporary dis tributions, diagnoses, and treatments of mental illness among men and women are examined. Focus on psychiatric dis order and gender-based discourse. This is the same course as Soc 426 and may be taken only once for credit.
Also offered for graduate-level credit as WS 526 and may be taken only once for credit. Prerequis ite: Upper-division standing. Cross-Listed as: Soc 426.
WS 428 - Lesbian History (4)
Surveys the history of les bian existence in the United States. Begins by asking what "lesbian" means, identify ing the different historical markers of female same-sexdes ire. Using a rich variety of primary and secondary sources, we analyze his torical attitudes about female same-sexdesire, follow the emergence of lesbian subcultures and
communities, examine the development of sexual identities during the twentieth century, and end by considering lesbian is sues.

## WS 430 - Visionary Feminism (2)

In this seminar, students will explore their relationship to feminis $m$ as visionaries and change agents. They will understand contributions of various feminis ms to social and personal transformation, explore the effects of gender, difference and equity in their lives and apply an intersectionallens to an analysis of their experience and examine their goals for the future.
Prerequisite: Upper-division standing.

## WS 431 U- Women in the Visual Arts (4)

This course studies both the representation of women and gender and the art and patronage by women in various media (painting, sculpture, architecture, printmaking, photography, textiles and mixed media). Explores 19th century and 20th century America and Europe. This is the same course as ArH431U and may be taken only once for credit.
Cross-Listed as: ArH431U.

## WS 442 - Women Writers in Global Contexts (4)

Study of the works of women writers fromthe postcolonial and non-Western world.
Prerequisite: junior-standing. Cross-Listed as: This is the same course as Eng 442 and may be taken only oncefor credit.

## WS 444 - British Women Writers (4)

Study of the works of British women writers with attention to themes, styles, and characteris tic concerns in the light of feminist criticis m and scholarship. This is the same course as Eng 444 and may be taken only once for credit.

## WS 445 - American Women Writers (4)

Study of American women writers, with attention to themes, styles and characteristic concerns, in the light of feminist criticis $m$ and scholarship. This is the same course as Eng 445.

## WS 451 - Interrupting Oppression (4)

Advanced exploration of diversity and social justice. It provides a framework for understanding specific interlocking systems of oppression and how they affectus. It gives a pedagogical frame for training about concepts of oppression and diversity; and how to apply this knowledge through the practice.

Also offered for graduate-level credit as WS 551 and may be taken once forcredit. Prerequisite: Upper-division standing.

## WS 452 - Gender and Race in the Media (4)

Primarily examines the representations of gender and race, including age, class and sexual orientation in various media (mainstreamand alternative), and will examine theoretical and methodological approaches which may be used to interpret these representations. In addition, considers the potential impact that media institutions have on people?s lives, political decisions and social relations. The overall aim is for students to understand how their own cultural identities affect their media consumption and social positioning. This course is the same as Comm452; course may only be taken once for credit.

Cross-Listed as: Comm 452.

## WS 453 - Feminismand Women?s Health (4)

The medicalization of women?s bodies sustains the myth that the female body is essentially a reproductive body and the male body the standard of health. Using a feminist lens of analysis, this class will examine these gendered conceptions relating to health, medical research, and treatments of gendered bodies.

Also offered for graduate-level credit as WS 553 and may be taken only once for credit. . Prerequisite: Upperdivision standing.

## WS 467 - Work and Family (4)

An examination of the effects of work on family, and family on work, in contemporary society. Includes study of dual-career and dual-work families, effects of maternal employment on children, impact of child care and elder care on the workplace, and parental leave and other workplace supports for families. Implications of research for social policy. Recommended prerequisites: Ps y 311 and 3 credits in courses numbered Ps y 321 or higher.

## WS 470U- Asian American Women's Studies (4)

Interdisciplinary coursefocusing on the contemporary experiences of Asian American women, examining ways in which race, gender, class, sexuality, and national identity shape the experiences of Asian American women. Topics: his tories of immigration and western colonization; family and community structures; representations and stereotypes in media and popular culture; sexuality and sexual identities; mixed-heritage and bicultural experiences; the politics of language; violence against Asian American women; labor force participation; relationship to feminis $m$; and activis mand resistance.

## WS 471 - Global Feminisms (4)

Themes and theoretical principles of global feminisms, with special emphasis placed on feminist movements from non-Western countries and regions, and theorizations of the transnational. Themes explored include colonialism, globalization, nationalismand nation.

Also offered for graduate-level credit as WS 571 and may be taken only only once for credit. . Prerequisite: WS 301 or consent of instructor.

## WS 479 - Women and Organizational Psychology (4)

Examines the relationship between gender and the social organization of the workplace. Focus is on gender development as socialization (e.g. hierarch and leadership, discrimination and harassment, deskilling) froma social ps ychological perspective. Strategies for change are cons idered. Recommended prerequisites: Ps y 310 and 3 additional credits in courses numbered Psy 330 or higher.

## WS 480 - Introduction to Critical Disability Studies (4)

Introduction to critical dis ability studies, what it is, and what it is not. Through lectures, readings, guest speakers, as signments and small group discussion, students will engage with each other to encourage application of new concepts in their current and future academic and personal lives.

Also offered for graduate-level credit as WS 580 and may be taken only once forcredit. .Prerequisite: Senior standing or instructor approval. .

## WS 481 - Disability and Intersectionality (4)

Focuses on intersectionality in the context of disability. Explores the historical and current contexts of disability in combination with race, ethnicity, gender, sexuality, and social class. Students engage with the application of these new concepts in their current and future studies and personal lives.

Also offered for graduate-level credit as WS 581 and may be taken only once for credit. . Prerequisite: WS 480 or consent of instructor.

## WS 482 - Topics in Global Sexuality Studies (4)

An examination of how sexualities are theorized and understood within a global frame of analysis. Topics include the sexual politics of migration, tourismand desire, colonialismand its lingering effects, militarization and sexuality, transnational biopolitics of sexuality, and the politics of global queer rights dis course.
Prerequisite: junior standing.
WS 501 - Research (1-12)
(Credit to be arranged.)

## WS 502 - Independent Study (1-9)

(Credit to be arranged.)

## WS 505 - Reading and Conference (1-8)

(Credit to be arranged.)

## WS 507 -Seminar (1-8)

(Credit to be arranged.)

## WS 509-Practicum(1-8)

(Credit to be arranged.)

## WS 510 -Selected Topics (3-4)

(Credit to be arranged.)

## WS 512 - Feminist Methodologies (4)

Introduces a range of feminist research methodologies, emphasizing interconnections among race, gender, sexuality, class, disability and other as pects of difference. Assesses knowled ge-generating strategies in terms of their suitability for feminist research and addressing power relations. Development of critical awareness in doing selfdirected feminist, queer, decolonial and critical race research.

Also offered for undergraduate-level credit as WS 412 and may be taken only once for credit. . Prerequisite: WS 315.

## WS 517 - Women in the Economy (4)

Different economic theoretical perspectives are presented to account for women's particulareconomic roles currently and historically. Emphasis on women's responsibility for child rearing and housework; women?s relatively low wages; occupational segregation by gender; economic differences among women due to ethnicity, generation, and class; and policy is sues with particular importance for women's economic situation. Recommended prerequisites: Ec 201, 202.

## WS 522 - Critical Perspectives on Quantitative Analysis (4)

Uses critical Indigenous, decolonizing, feminist and antiracist lenses to evaluatequantitative research applications, including development of research questions; study designs; appropriate use of statistical and other quantitative methods; audience and dissemination of quantitative
findings. Interdisciplinary and intersectional focus and applications. Note: Not a methods course; does not teach statistical or quantitative methods.
Also offered for undergraduate-levelcredit as WS 422 and may be taken only once for credit. Prerequisite:Familiarity and experience with basic statistical and quantitative data and methods. Cross-Listed as: This is the same course as GRN 522 and may be taken only once for credit.

## WS 525 -Sociology of Gender (4)

Consideration of the theoretical, methodological, and empirical contributions of current sociological scholarship on gender. Emphasis on the intersection of gender, sexuality, race/ethnicity, and class. Analysis of topics such as: masculinity/femininity, parenting, family, education, work, sexualities, reproduction, politics, and social change. This is the same course as Soc 525 and may be taken only once forcredit.
Also offered for undergraduate-level credit as WS 425 and may be taken only once for credit. . Prerequis ite: junior standing. Cross-Listed as: Soc 525.

## WS 526 - Gender \& Mental Health (4)

Social and historical explanations of, and research on, mental illness and mental health, with a focus on gender. Contemporary dis tributions, diagnoses, and treatments of mentalillness among men and women are examined. Focus on psychiatric dis order and gender-based discourse. This is the same course as Soc 526 and may be taken only once forcredit.
Also offered for undergraduate-level credit as WS 426 and may be taken only once for credit. Cross-Listed as: Soc 526.

## WS 530 - Women in the Visual Arts II (4)

This course studies both the representation of women and gender and the art and patronage by women in various media (painting, sculpture, architecture, printmaking, photography, textiles and mixed media). Explores 19th century and 20th century America and Europe.

## WS 545 - American Women Writers (4)

Study of American women writers, with attention to themes, styles and characteristic concerns, in the light of feminist criticis $m$ and scholarship. Recommended prerequisite: 15 credits in literature. WS 260 recommended.

## WS 546 - American Women Writers (4)

Study of American women writers, with attention to themes, styles and characteristic concerns, in the light of feminist criticis $m$ and scholarship. Recommended
prerequisite: 15 credits in literature. WS 260 recommended.

## WS 551 - Interrupting Oppression (4)

Advanced exploration of diversity and social justice. It provides a framework for understanding specific interlocking systems of oppression and how they affectus. It gives a pedagogical frame for training about concepts of oppression and diversity; and how to apply this knowledge through the practice.

Also offered for undergraduate-level credit as WS 451 and may be taken only once for credit.

## WS 552 - Gender and Race in the Media (4)

Primarily examines the representations of gender and race, including age, class and sexual orientation in various media (mainstreamand alternative), and will examine theoretical and methodological approaches which may be used to interpret these representations. In addition, considers the potential impact that media institutions have on people's lives, political decisions and social relations. The overall aim is for students to understand how their own cultural identities affect their media consumption and social positioning. This course is the same as Sp 552 ; course may only be taken once for credit.
Cross-Listed as: Comm 552.

## WS 553 - Feminismand Women?s Health (4)

The medicalization of women?s bodies sustains the myth that the female body is essentially a reproductive body and the male body the standard of health. Using a feminist lens of analysis, this class will examine these gendered conceptions relating to health, medical research, and treatments of gendered bodies.
Also offered for undergraduate-level credit as WS 453 and may be taken only once for credit. . Prerequisite: Upperdivision standing.

## WS 555 - Gender and Education (4)

Explores the significanceof gender in educational work. The focus will be on the history of gender arrangements in educational org anizations and the formation of gender roles in contemporary American society, particularly in the family, schools, and the economy. Students will examine differential socialization of males and females, ongoing practices in educational organizations that are gender-related and/or gender biased and the convergence of gender, race, and class in educational organizations. This course is cross-listed as ELP 455; may only be taken once for credit.

## WS 570 - Asian American Women's Studies (4)

Interdisciplinary course focusing on the contemporary experiences of Asian American women, examining ways in which race, gender, class, sexuality, and national identity shape the experiences of Asian American women. Topics: histories of immigration and western colonization; family and community structures; representations and stereotypes in media and popular culture; sexuality and sexual identities; mixed-heritage andbicultural experiences; the politics of language; violence against Asian American women; labor force participation; relationship to feminis $m$; and activis mand resistance.

## WS 571 - Global Feminisms (4)

Themes and theoretical principles of global feminisms, with special emphasis placed on feminist movements from non-Western countries and regions, and theorizations of the transnational. Themes explored include colonialis m, globalization, nationalismand nation.
Also offered for undergraduate-levelcredit as WS 471 and may be taken only once for credit. .

## WS 580 - Introduction to Critical Disability Studies (4)

Introduction to critical dis ability studies, what it is, and what it is not. Through lectures, readings, guest speakers, as signments and small group discussion, students will engage with each other to encourage application of new concepts in their current and future academic and personal lives.
Also offered for undergraduate-level credit as WS 480 and may be taken only once for credit. Prerequisite: Senior standing or instructor approval.

## WS 581 - Disability and Intersectionality (4)

Focuses on intersectionality in the context of disability. Explores the historical and current contexts of disability in combination with race, ethnicity, gender, sexuality, and social class. Students engage with the application of these new concepts in their current and future studies and personal lives.
Also offered for undergraduate-levelcredit as WS 481 and may be taken only once for credit.

## WS 583 - Critical Disability Studies Service Learning I

 (2)The fociof the 3 quarter sequence are to: prepare students to be culturally res ponsive change agents working equitably with people with dis abilities, provide an opportunity for students to work cooperatively with disability communities, and result in an in-depth study of a policy impacting people with dis abilities. This is the first course in a sequenceof three: WS 583, WS 584, WS 585 and must be taken in sequence.

Prerequisite: WS 580, WS 581. .
WS 584 - Critical Disability Studies Service Learning II (2)

The foci of the 3 quarter sequence are to: prepare students to be culturally responsive change agents working equitably with people with dis abilities, provide an opportunity for students to work cooperatively with disability communities, and result in an in-depth study of a policy impacting people with disabilities. This is the second course in a sequence of three: WS 583, WS 584, WS 585 and must be taken in sequence.
Prerequisite: WS 580, WS 581, WS 583.

## WS 585 - Critical Disability Studies Service Learning III (2)

The fociof the 3 quarter sequence are to: prepare students to be culturally responsivechange agents working equitably with people with disabilities, provide an opportunity for students to work cooperatively with disability communities, and result in an in-depth study of a policy impacting people with disabilities. This is the third course in a sequence of three: WS 583, WS 584, WS 585 and must be taken in sequence.
Prerequisite: WS 584..

